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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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The Science of Mixing

IN weather such as, for the moment, we are enjoying or enduring, the thoughts of many turn naturally to the art of mixing cooling beverages. It is an art for which all who favour calm minds in cool bodies should be grateful, and it is not an inappropriate moment to be reminded, as we are by the group of trade notes published in this issue, of the larger industrial arts of mixing which play so large and important a part in chemical operations. Chemical manufacture has become a far more complicated affair than it was even a generation ago. The range of raw materals employed has been enormously extended. With all this a new technique has been developed for the weighing and mixing of ingredients in exactly the right proportions and for replacing the older, less exact, and less economical methods by strictly scientific apparatus. Whether for liquids or solids or admixtures of both, whether the product be cement, fertilisers, pottery, colloidal emulsion, a paint, a popular sauce, a soap, a face powder, a pill, or an ointment—there is now available the appropriate machine for dry mixing or wet mixing, performing the operation with scientific accuracy and thoroughness, ensuring the desired blend without damage to the material and with a great saving of time and trouble. The finished article of commerce to-day must be as nearly perfect as possible, whether it be cement for modern arterial roads and giant buildings or the most delicate pharmaceutical products, and this is only possible by the use of the most perfect mechanical apparatus. The notes we publish this week on some of the machines placed on the market by British firms give some idea of the size and variety of the mixing industry, and may be commended to the notice of all interested in the efficient blending of materials.

The Dyestuffs Report

IT is interesting to see from an official announcement published this week that the long awaited report of the Development Committee under the Dyestuffs Act is to be issued "during the next few days." The Development Committee which is responsible for this very important document is presided over by Mr. W. J. U. Woolcock and consists of representatives of the dyestuff manufacturing firms, of the dyestuff users, and of independent members representing the Government and other interests. The Government may be congratulated on its decision to publish this report in good time before the expiration of the Act, and everyone concerned about the future of the industry will look forward to its terms with great interest.

The secret of what is contained in the report has been very well kept. According to an official of the Board of Trade, the report will indicate that the system prohibiting imports except under licence has considerably increased the home output of dyes since it was put into operation, and has had an appreciable effect on the increase of exports of dyestuffs and intermediates. As a statistical and historical survey of the industry during the past ten years, the report will undoubtedly possess a permanent interest, and the balanced composition of the Committee is a guarantee that the views of all the parties concerned will be stated with studious fairness. It is obvious, however, that the point of view of the dyestuff manufacturers must differ from the point of view of the dyestuff users, and it will be interesting to see how far the Committee has succeeded in reconciling views that must be of necessity to some extent divergent. If it is found that a unanimous report has been agreed upon, it will be a tribute to the tactful way in which the matter has been handled and to the sincere desire of all members of the Committee to consider the general good of the industry in preference to any sectional interests. The main interest, however, of the report will be not in its facts, important though these are, but in its recommendations as to future policy. The Act was passed, as its opponents insistently remind us, for "ten years and no longer." But the future of a national industry is more important than a mere technical compliance with a legal formula agreed upon by all parties ten years ago. Conditions have materially changed since then, and the question whether the Act is to be allowed to lapse altogether or to be extended

in some modified form must be decided not by what was considered suitable ten years ago but by what is considered necessary in the national interest to-day.

Whether the report will make any recommendation for the continuance of the Act or not is a matter of speculation. If it should prove that the report is signed unanimously it might then be expected that, even without recommending the continuance of the Act, a strong plea for further co-operation between makers and users might be made. So far the Government have given no indication of their views and sympathies in this matter. It requires no great imagination to appreciate that opinions inside the Government are not all identical, but the President of the Board of Trade has made it clear by his recent replies to questions in the House of Commons that the dyestuffs situation will be carefully considered in all its aspects, and that this valuable report by a body of first-class experts will have a very considerable bearing upon the Government's decision. This is as much as can be said with safety at the present stage; possibly before another issue of THE CHEMICAL AGE appears the report itself may be available and some clearer vision may be possible of the probable course of future policy.

The 100th Year of the B.A.

THIS year, the 100th year of its existence, the British Association for the Advancement of Science holds its annual meeting in the city of Bristol. Sir Thomas Holland will be succeeded in the presidency by Professor F. O. Bower who, as an authority on botanical research and a student familiar with the developments of Darwin's theories, has appropriately chosen as the subject of his address "Size and Form in Plants."

In the general programme the Chemistry Section occupies an important place and the officials may be congratulated upon having arranged an interesting and important series of discussions. Professor G. T. Morgan, the sectional president, has decided to speak on "A State Experiment in Chemical Research," and his views on the work of the chemical research laboratory, of which he has had charge since its establishment, will be cordially welcomed. On the opening day the contributors of papers will be Sir William Pope, whose subject is not announced; Professor F. E. Francis, Dr. T. Malkin and Mr. S. H. Piper on "Natural Fatty Acids"; Dr. M. Nierenstein on "Pyryllium Series"; and Dr. H. T. S. Britton, Dr. R. A. Robinson and Mr. W. L. German on "Complex Acids of the Rarer Elements." On Friday, September 5, a discussion of great topical interest will be that on the present position of the British dyestuffs industry, in which a number of recognised scientific and commercial experts will give their views. By that time, in all probability, the dyestuffs report will have been published and the views expressed are likely to be too representative and important to be overlooked by the Government. On Monday, September 8, there will be a general discussion on "Chemotherapy" in which Dr. F. L. Pyman, Professor G. Barger, Dr. A. J. Ewins, Dr. H. King, Dr. T. A. Henry, Professor R. Robinson, Professor C. S. Gibson, and Professor E. C. C. Baly will take part. On Tuesday, September 9, there will be paper on various subjects by Professor N. Semenoff, Dr. R. C. Menzies and Dr. F. G. Soper. These meetings will be varied by visits to a number of local chemical works.

Outside the Chemistry Section there are several additional papers of very distinct chemical interest. These include one by Sir John Russell on the influence of fertilisers and another by Sir Frederick Keeble on agricultural problems in South Africa in the Agriculture Section. In the Mathematical Section there are several papers on the border-line between physics and chemistry, and one of particular chemical interest by Dr. C. F. Brett on the synthesis of ammonia by controlled electron streams. The evening discourses include an address by Dr. R. E. Slade on "The Nitrogen Industry and our Food Supplies." The meetings begin on Wednesday next and continue until Wednesday of the following week. The programme generally may be said to be fully up to the usual standard.

A Patron of Science

IT is pleasant to read Sir James Crichton-Browne's tribute to the qualities of the late Duke of Northumberland and his acknowledgment of his sincere interest in science. No fewer than three Dukes of Northumberland have now in succession served as Presidents of the Royal Institution during the last 53 years, and all of them have rendered it signal service in maintaining its dignity and promoting its usefulness.

Of the late Duke's interest in science, especially in its physical department, Sir James remarks that his breadth of knowledge and experience, his clearness and integrity of intellect, and his dignified composure fitted him singularly well for the post that he was gratified to fill. An ever-welcome occupant of the chair at its lectures and meetings, he was a generous donor to the Institution's funds, frankly accessible when appealed to, sparing no pains when his assistance was sought. A certain superficial austerity of manner dissolved instantly in friendly intercourse, revealing his truly genial disposition and kindness of heart. The Duke's death is particularly regretted because he was chairman of the committee engaged in the reconstruction of the Institution's building and took an active part in its proceedings. He would in the ordinary course have presided at the celebration of the centenary of Faraday's discovery of electro-magnetic induction to be held in September of next year. Those who remember the dignity with which he presided over the Faraday celebrations of a few years ago, when the isolation of benzene was commemorated, will understand the regret at his absence in a similar capacity from the important celebrations of next year.

The Calendar

Sept. 3–10	British Association for the Advancement of Science: Sept. 4—Chemistry Section Presidential Address, "A State Experiment in Chemical Research," Professor G. T. Morgan. "Natural Fatty Acids," Professor F. E. Francis, Dr. T. Malkin and S. H. Piper. "Pyryllium Series," Dr. M. Nierenstein. "Complex Acids of the Rarer Elements," Dr. H. T. S. Britton, Dr. R. A. Robinson, W. L. German. Sept. 5—Discussion on "The Present Position of the British Dyestuff Industry."	Bristol

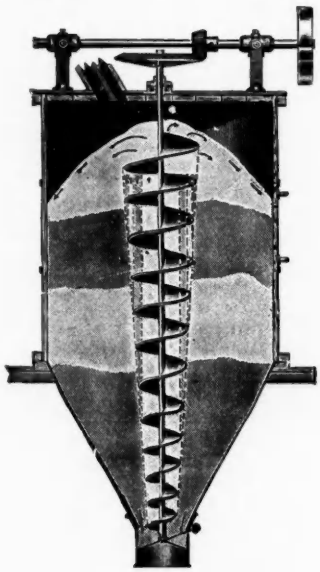
Chemical Mixing Machinery

Review of Modern Plant and its Principles

The subject of mixing machinery has received a very large share of attention for the chemical engineer. New plant is steadily evolved in step with the discovery of new processes, and existing apparatus adapted for speedier working and more thorough mixing. The products of some of the principal manufacturers of chemical plant are reviewed in the following pages.

A. R. Tattersall and Co.

THE great landscape painter, J. W. M. Turner, upon being asked how he mixed his paints, pertinently replied, "With my brains." Mixing, it must generally be admitted, requires brains, but having exercised those brains and decided on the precise and exact component part in the proportion most likely to effect the object in view, then mechanical skill comes into play to carry out the purpose the brains may have determined on, with the greatest accuracy and economy of handling.



In the building trades one has mixtures, cement and mortar, for example; and even in road making there must be mixing. In the foundry there must be a mixture of sand, in the pottery a mixture of various clays. The formula for the mixing of a popular sauce, a soap, a face powder, a pill or an ointment, is sometimes worth a fortune, and the very success of the formula often lies not so much in the nature of the ingredients as in the correct proportions and thorough amalgamation of those elements.

The inventive faculties of engineers have been concentrated during the past generation, and especially during the period of the war, on designing mixers and blenders of every conceivable shape, and for an infinite variety of purposes, to cope with the necessity for producing substitutes. Almost every kind of mixture needs a machine of special construction to carry out the objects of the producer to the best advantage, depending on the friability, granulation, moisture content, or viscosity of the component parts. Some require severe treatment to break up lumps and knead one substance into another, as in the case of paints and ointments. Some require a whisking movement to emulsify the substance, and some require as gentle handling as is consistent with the equal distribution of grains or powders of various specific gravities dumped into a receiver in bulk and turned out an even sample.

In everything, especially in mixers, simplicity is of supreme importance, and therefore, the simple type of mixer, such as the "Geyser" here illustrated, appeals to the ordinary non-technical manufacturer as a common-sense solution of his mixing problem, provided always that the materials to be mixed are reasonably granular and dry.

The principle involved in this machine, as will be readily observed in studying its construction, is one of ebullition or boiling agitation. One may dump into the vertical container sack after sack of one material or another, either as the machine is running or at rest, and the archimedean screw conveyor, by reason of its wider upper blades, propels a varying quantity of each layer of stock from bottom to top, where it again pours away over a circular dam to the outer circle of the container. Hence there is a multiplicity of divergent activities at work to blend various particles together in a gentle manner with a minimum of power and attrition. Where large quantities are to be mixed, this machine provides facilities for economically dealing with them efficiently, and with little manual labour or possibility of waste.

For mixing ointments, salves and oily or viscous substances requiring water or steam-jacketed vessels, enamelled or iron, lines of machines to suit every variety or combination are built and supplied by A. R. Tattersall and Co., 75, Mark Lane, London, from their engineering works at Towcester, Northamptonshire.

The Kestner Evaporator Co., Ltd.

STIRRING or mixing may in general be defined as the production of relative movement between particles of different substances in order to cause intimate contact between them.

Stirrers are usually required for the mixing of two fluids, dissolving a soluble solid, or keeping particles in suspension. Unfortunately there are no basic units which can be used for expressing stirrer performances with the result that it is difficult to make any definite comparison between various types of stirrers, unless trials are carried out under exactly similar conditions. Mechanical agitators may be roughly divided into three types, namely paddle, propeller and turbine. With the paddle type there is naturally a tendency for the whole mass to rotate in the direction of rotation of the paddle and various arrangements of stationary vanes are fitted to break up the stream of liquid and increase the mixing. There are numerous designs possible employing differences in the shape and number of paddles and stationary vanes. With this

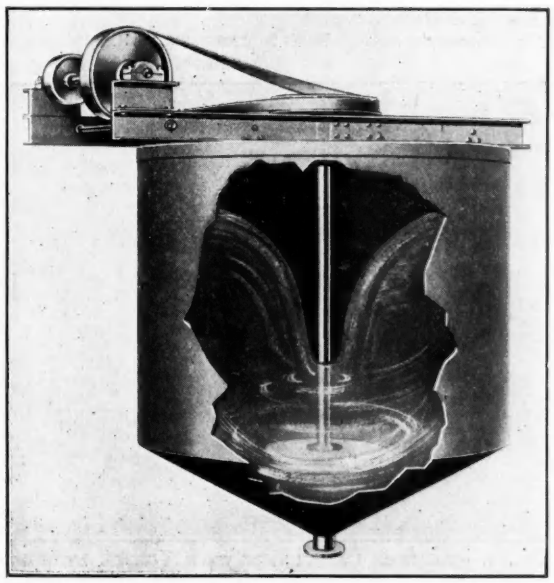


FIG. 1.—KESTNER VORTEX STIRRER.

type mixing is chiefly due to the horizontal component o. the liquor velocity. With the propeller type emphasis is

given to the upward component of the liquor velocity. Various designs are possible with this type of stirrer, employing two or more propellers on separate shafts rotating in opposite directions. In certain cases the propeller is arranged inside a small cylinder but this has the disadvantage that a certain amount of shock loss will occur, thus increasing the power consumption. For dealing with viscous materials a helical type of agitator may be used which is a development of the enclosed propeller type.

The Kestner Vortex Stirrer has been evolved in order to combine in one stirrer the two components of liquor velocity, and to avoid the disadvantages of the previously mentioned types of agitator which, generally speaking, will require some form of foot-step or other bearing which must be arranged inside the liquor. A typical arrangement of this stirrer is shown in Fig. 1, from which it will be seen that it consists essentially of an impeller and shaft, supported from a top bearing. The effect of rotation is to cause the liquor to flow to the eye of the impeller which discharges it at the outer periphery so that the whole contents of the vessel pass through the impeller in turbulent flow. With a suitable speed the surface of the liquid in the vessel, which is horizontal when at rest, will assume the shape of a paraboloid of revolution as is indicated in Fig. 1. The depth of the vortex so formed naturally varies with the conditions under which the stirrer is operating, depending upon the nature of the material being agitated, speed of rotation, etc., but depths varying from a few inches to several feet can easily be obtained. A particle leaving the impeller describes an ascending spiral path of increasing radius and decreasing velocity. Its motion is finally converted into a downward whirl, thus causing the particle to return to the eye of the impeller. It will be seen that efficient mixing is effected with this type of stirrer owing to the variation in velocity of adjacent particles.

Mention may be made of the mechanical design of the stirrer as it will be noticed that only one bearing is employed, arranged outside the liquor and of a special flexible type.

Fig. 2 illustrates a Kestner Causticiser fitted with a Vortex Stirrer from which it will be seen that the stirrer occupies very little space and may readily be fitted in existing vessels. Apart from the general types mentioned above, a number of processes require stirrers specially designed to meet the particular conditions involved. Fig. 3 illustrates a Kestner Stirrer constructed in Staybrite steel and specially designed for a vessel in which chemical reactions are carried out. This illustration shows only the rotating portion of the stirrer but in addition a number of fixed arms or vanes are arranged in the vessel itself.

An important suggestion is that for ordinary stirring

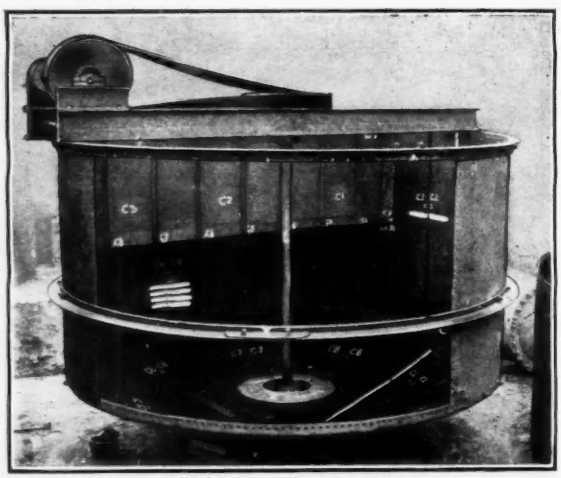


FIG. 2.—KESTNER CAUSTICISER WITH VORTEX STIRRER.

problems such as the mixing of liquids or dissolving of solids, some standard basis should be evolved which would give comparison of stirrer performances. This might readily be done by taking the time taken to cause complete solution of a soluble solid in water in a definite size of vessel with fixep quantities of solid and water. The relative times taken for this operation with different types of stirrer together with figures as to H.P., should form a useful basis of comparison for all general purposes of this nature.

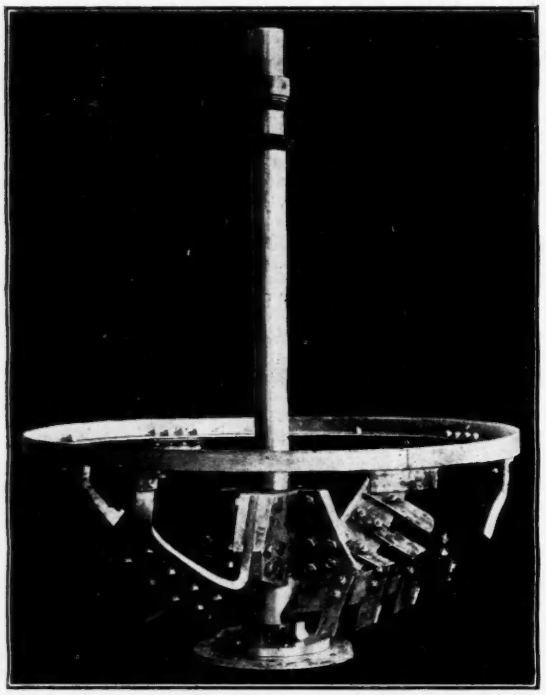


FIG. 3.—SPECIAL TYPE STIRRER IN STAYBRITE STEEL. MANUFACTURED BY THE KESTNER EVAPORATOR AND ENGINEERING CO., LTD.

Wm. Gardner and Sons, Ltd.

For accurate blending at one operation of any number or class of dry powdered ingredients or for mixing thin or thick liquids, a wide variety of machines exists in the " Rapid " range of Wm. Gardner and Sons (Gloucester), Ltd., Bristol Road, Gloucester. Not only are they made with extremely large capacity—to hold up to 5 tons at a single charge—but analytical tests have shown that less than an ounce of any one powder can be thoroughly blended with lbs. or cwts. of any others before being discharged from the mixing chamber. This firm's mixing machines are now fitted with their patent internal " reversing arm " agitators without extra cost. Accessibility is a noted feature and in all but the largest sizes the bottom of the agitator opens by hinges and set nuts so that as soon as one class of mixing is completed (and the contents automatically discharged through the outlet) every part of the machine is exposed to view and can therefore be thoroughly cleaned without fear of one powder or colour contaminating that which follows it. The door for placing the ingredients into the mixing chamber is practically dust-proof so that little or no loss can take place and dustless receiving boxes are also supplied for receiving the contents of the machine.

Many powders require the addition of essences, liquids and perfumes during the process of mixing and for this purpose special machines are produced, both mixers and sifters and mixers combined. In the latter case the spraying apparatus consists of an air pump, compressor and liquid container, all fitted outside the machine and easily removable for cleaning and refilling. The patent spraying device is fixed between the sifting and mixing chambers and the powders before they can reach the agitator pass through a vapoury cloud or mist of essence, finer than the particles of the powder itself and therefore quickly absorbed. The movement of a hand lever operates a free wheel clutch instantly throwing the sprayer

out of action and converting the machine to an ordinary sifter and mixer. In the case of the mixer pure and simple there is placed above the agitator a special perforated tube with nozzles forming a sprinkler for distributing the liquid. A valve at the top regulates the flow, or shuts it off altogether. For delicate powders or where great accuracy of blend is necessary the use of the patent sprayer is recommended. The machine can be built in iron, wood, brass, aluminium or any form desired.

The liquid mixer is specially designed for blending or mixing polishes, creams, oils, liquids, colours, pastes, inks, extracts, and animal medicines, and also finds a large use for India rubber solutions, in which case it is fitted with packed gland bearings and a special outlet. For the other liquids the agitator is fitted in water-tight adjustable packed bearings, secured to the ends of the mixing chamber. The agitator is similar in design to the firm's well-known patents, and when not required for liquids the machine will mix dry powders in the same manner as other models.

An interesting machine has been designed to turn out a granulated meal. The powders, molasses and liquids, etc., are mixed together and kept in a granular state by two sets of agitators, one working inside the other in opposing directions, creating a tearing or disintegrating action. These double agitator spirals have serrations or saw-shaped teeth fitting into each other, one being driven at a higher speed than the other. This thoroughly mixes the ingredients in a granular form, preventing the troublesome balling or pasting up, usual with damp or moist powders. A grid outlet is fitted for the discharge so that only the material granulated fine enough to pass out is delivered into suitable receptacles under the agitator chamber.

G. C. Hurrell and Co.

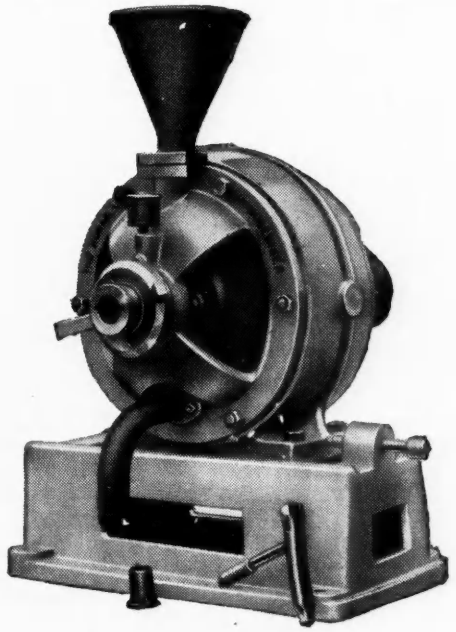
The Hurrell Homogeniser has now been on the market for six years, and has become fully familiar to technical chemists. The machine combines a high efficiency with an extreme simplicity of construction and ease of control, which is essential to any machine which has to take its place amongst the plant of a chemical or other works, and be superintended by operatives possessing no special skill. The actual work is performed by the forces set up in a thin stream of a liquid suspension which is made to pass between the inner walls of a cylinder and the periphery of a smooth faced, pulley-like rotor which revolves at great speed, the clearance between the metal surfaces being generally only a few thousandths of an inch. The distinctive feature of the machines is the shape and disposition of the film ; this is so arranged that centrifugal force acting upon the liquid within the gap, leaves its compactness unaffected and no voids or cavities are developed. Advantage is taken of the tendency of the contents normally to remain in the gap, to introduce the pressure-producing feature of the machine by which an entirely automatic regulation of output is effected simply by delivering the materials to the feed hopper at the required rate.

The action of the mill in disrupting the fluid, or fluid suspension, into an infinite number of minute particles gives an extraordinarily large area of contact between two or more substances, which are fed simultaneously through the mill. The washing of tar oils, for instance, can be carried out as a continuous process on the Hurrell Homogeniser. Sublimed anthracene, as another example, may be dispersed in a fine state of subdivision and wetted by the bi-chromate solution to accelerate the oxidation process. Soaps of the heavy metals are made by direct contact between the finely dispersed suspension of the insoluble bases and fatty acids.

The most widespread application of the mill for disintegrating purposes is in the dyestuff industry. Insoluble dyes for both vat dyeing and calico printing are reduced to a pseudo-colloidal condition whereby their covering power is very greatly increased. Sulphur and other crystalline solids are reduced to a very fine state of sub-division, and to get the maximum result from a given expenditure of time and power, it is desirable to use the machine in conjunction with a sedimentation tank, so that particles not fully ground in passing through the mill may be returned for further treatment.

Newsprint ink can be made practically in one operation with the homogeniser. In paint manufacture its principal use is in dispersing soft pigments in more fluid vehicles.

The makers, G. C. Hurrell and Co., Old School Works, Woolwich Road, London, S.E., announce that the demand from different parts of the world steadily increases not only for



THE HURRELL HOMOGENISER.

homogenisers, but for their new development in the form of a simple pressure type emulsifier, the " Hurcol," which achieves its purpose by means of a pump with a slight clearance between the plunger and the barrel. Among its outstanding advantages are slow movement, simplicity of parts and an entire absence of entrained air in the emulsion.

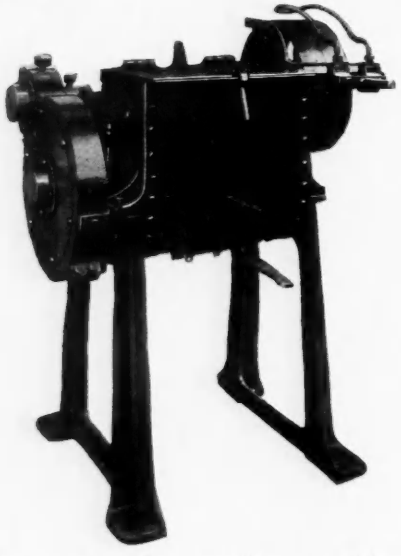
Buffoline Noiseless Gear Co.

Wide applicability, including ability to deal with materials with a high moisture content, is a feature of the KEK mill, manufactured by the Buffoline Noiseless Gear Co., Ltd., 27, Lots Road, Chelsea, London. It is an effective and economical machine for the reduction and blending of a large range of products, and is available for the following operations : Reduction of friable material in dry, moist (plastic) or wet condition ; blending together in an intimate manner two or more materials ; grinding dry substances in (or into) liquids to secure homogeneous conglomerates or permanent suspensions ; blending to a uniform compound liquid two or more liquids, either with or without chemical reaction ; and defibring—over a wide range of materials.

The mill is of the intercalating pin type, and its design and construction is such that vibration is reduced to a minimum, and it can be installed without the cost of heavy foundations. The space occupied is less than that for any other type of mill giving a relative output. It is fitted throughout with ball-bearings, and a special metal is employed in the worm drive, which runs in an enclosed oil bath. The grinding discs and circular discharge ring are designed and constructed to permit of the free discharge of material. The inflow and circulation of air caused by the rotary disc keep the material perfectly cool, so that products of low melting point, such as stearine, resin, glue, gums, waxes, sugar, etc., can be rapidly ground without deterioration or risk of clogging. The " KEK " mill acts as an efficient blender, and in many instances grinding and blending can be accomplished simultaneously of (1) solids, (2) solids and liquids, (3) liquids, *e.g.*, colours, dyes, paints, printing inks, oils, pharmaceutical preparations, etc. The mill can be easily and thoroughly cleaned, a great advantage when it is necessary to change over from one material to another.

Brinjes and Goodwin, Ltd.

The most important side of the activities of Brinjes and Goodwin, Ltd., of 36, Cold Harbour, Poplar, London, and of Reading, is the manufacture and installation of mixing and grinding machinery for paints, inks, pastes, etc., and they are among the oldest makers of roller mills in the world. They produce in particular a sturdy horizontal mixer, a type that has proved very efficient in dealing with heavy or thick powders



A Brinjes and Goodwin Horizontal Mixer.

and pastes such as white leads, zinc whites and accumulator pastes. In this example the knives, in addition to scooping the material from the bottom and turning it over to the top of the mixer, are designed so as to impart a horizontal motion to the material, varying in accordance with its distance from the axis. This complex movement of the mass causes the various particles, irrespective of their densities, to be rubbed past each other at different speeds, and thus ensures perfect mixing. The sides and ends of the container are swept by the knives to avoid the material adhering thereto and thus not

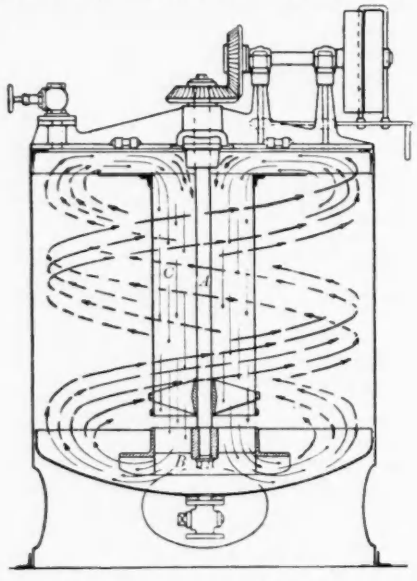
Mixing Spindle showing Hand Forged Steel Knives.

being mixed. When dealing with pastes of an exceptional nature, fixed baffle knives are provided.

Brinjes and Goodwin mixers are made in thirteen standard sizes from 2½ to 170 gallons capacity. In the smallest models the mixing spindle is driven direct, but in the others from a countershaft by accurate machine cut gears enclosed in a gear case and oil bath. The standard outlet from the machine consists of a sliding door operated by a handwheel through a rack and pinion in the larger sizes, and constructed so as to avoid any space into which material can collect without being mixed. Jacketed mixers can be supplied for steam heating and water cooling, or double mixers, which are particularly suited for delivering material directly into a mill. Mixers are, of course, made of resistant materials when they are intended to deal with substances having a chemical action on iron and they can be varied to suit individual needs.

S. H. Johnson and Co., Ltd.

A very high degree of efficiency is claimed for the "Vortex" mixer, manufactured by S. H. Johnson and Co., Ltd., Stratford, London. It is simple in construction, yet acts rapidly in the manner explained in the accompanying diagram. A centrifugal vane of special design rotating near the bottom of the mixer at the centre causes the liquid in the immediate vicinity to be forced outward with considerable velocity, at the same time imparting to it a rotary motion in a horizontal direction. Near the top of the mixer curved plates are fixed, these being so arranged and of such a shape that they catch the upper layer of rotating liquid and deflect it to the centre, where the conflux of the streams from the several deflecting plates causes a considerable vortex, down which the liquid descends to feed the vane at the bottom where it is again thrown out to the sides of the mixer. There is thus a rapid and continuous circulation of the whole contents of the mixer in a vertical direction in addition to the usual horizontal swirling. This two-fold motion of the liquid in the mixer results in the most intimate and uniform mixing in a very short time. So powerful is the effect that large leaden shot introduced into one of these mixers filled with water are easily carried to the top and circulated with the water. It is



obvious, therefore, that mixers of this type are especially suitable for dissolving precious and other metals from crushed ores, mixing heavy colours, mixing fuller's and other earths, charcoal, decolorising carbons, etc., with oils, sugar syrups—in fact, for all purposes where rapid and effective mixing is required.

This gear utilises the natural movement of the liquid to produce the vortex effect, and this, coupled with the absence of any baffling of the liquid, enables the mixer to be operated with the minimum consumption of power. This vortex mixing gear can, of course, be fitted to vessels of very many different types. The containing vessel may be simply an open-top tank of mild steel, cast iron, copper or aluminium. Coils may be fitted for the circulation of some fluid for heating or cooling, or the container may be jacketed for the same purpose. For dealing with volatile liquids, the tank is totally enclosed, and may also be made to withstand internal pressure, thus enabling it to be used as a montejus as well as a mixer. Where simple stirring gear is for any reason preferable to the vortex mixing gear, mixers constructed in this way can be supplied. The gear can be made for operating either by belt-drive from existing shafting, self-contained steam engine, or self-contained electric motor.

Follows and Bate, Ltd.

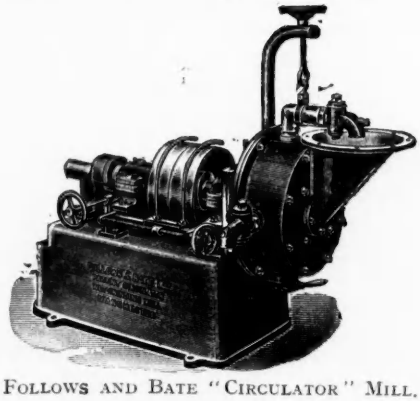
Of the many types of mixing machines—horizontal, vertical and rotary—now on the market and each having their special features, the "Powerful" horizontal mixer made by Follows and Bate, Ltd., Gorton, Manchester, is one of the most useful for variety of work and general handiness. The machine will be found specially suitable when the materials to be operated upon are not of too dense of character or too great a specific gravity. It secures the blending of dry colours or powders to uniformity, or, by the addition of liquids, the mixing is done so thoroughly that every grain of powder, however minute, is made to absorb its share of moisture and produce a liquid, semi-liquid, or paste-like dough or putty. This machine is made in many sizes for large or small requirements; it is of simple construction and powerfully built. The open pan or hopper is constructed of steel, copper or brass; it swings between two heavy standards and is locked firmly or released instantly by the withdrawal of a stop catch. The gearing which drives the horizontal beaters is neatly covered in, being protected from dirt and the possibility of accidents. The beaters which are of peculiar shape and made of toughened steel, are quickly detachable for cleaning, and rotate in opposite directions, in such a manner as to prevent the contents of the hopper from gathering in a mass during the process of mixing. The operation is therefore not only thoroughly performed, but the material can be instantly ejected by drawing the catch; if thick in consistency the hopper may be allowed to swing completely over and discharge into a vessel placed beneath; if thin, the hopper is slowly tilted until the liquid is discharged through the spout provided.

The "Circulator" Mill

Another notable Follows and Bate product, the "Circulator" Liquid Grinding, Mixing, and Disintegrating Mill, is constructed on the high-speed vertical plate system, one stationary and the revolving.

The materials are fed in at an enamelled hopper which communicates with the eye of the grinding discs, and the product, after passing through the plates, is delivered into an enclosing casing, in which the materials are subjected to violent agitation before discharging through the top, side, or bottom valves ensuring thorough incorporation of the various ingredients. Fluid materials which are difficult to reduce in once through may be allowed, at the will of the operator, to pass automatically through the mill plates over and over again, by simply opening the top circulating valve and without handling in any way, and by the use of the same circulating device, the machine can be easily cleaned for change of colour or material.

There is no gearing, the single spindle, carrying the pulleys, runs in ring self-oiler bearings, and the end thrust is taken up in a large hardened steel ball thrust bearing. The adjustment is of the firm's patented worm and worm wheel type, and is provided with a calibrated scale showing the distance between the grinding plates in divisions equal to one thousandth part



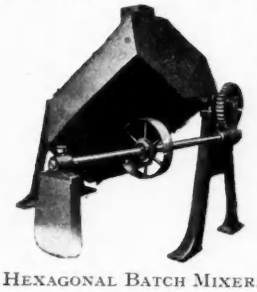
FOLLOWS AND BATE "CIRCULATOR" MILL.

of an inch, and by noting the position of the indicator on the scale for various products, it is practicable to give definite instructions to the man in charge as to the exact setting to be adopted in each case; for instance, some materials may require the plates to run "touching," others with openings of one, two or three thousandth parts of an inch.

A simple swivel davit is provided so that opening and closing the end casing when necessary can be carried out by one man. The grinding plates are of various forms, smooth, heavy grooved, fine grooved, curve grooved, serrated, counter grooved, etc., and clients are advised as to the most suitable types for their particular processes.

L. A. Mitchell

L. A. Mitchell, of Harvester House, 37, Peter Street, Manchester, offers a wide range of mixers suitable for dealing with all types of chemicals, either wet or dry. Of particular interest is the hexagonal batch mixer for enamelling works, glass works, and other chemical works where mixing is effected in the dry state. Other specialities are the steam jacketed chemical mixer for dyestuffs and other chemicals, which can also be supplied for direct heating or for heating by oil bath; the ball mill for pulverising or mixing all classes of chemicals, either in the wet or dry state; "Carr" type disintegrators and mixers, for heavy duty, such as mixing coal, fireclay, spent oxide, chalk, etc.; superphosphate mixers, for treating superphosphates and artificial manures. Enamelled cast iron mixers, manufactured under a patent vacuum process, which ensures homogeneous adhesion between the enamel and the metal, and homogeneous lead-lined apparatus, are further examples of the extensive range of products supplied.



HEXAGONAL BATCH MIXER.

W. J. Fraser and Co., Ltd.

Standard mixers, with capacities of from ½ to 5,000 gallons are included in the range of W. J. Fraser and Co., Ltd., Dagenham, Essex. They can be made in any material, open or closed types, suitable for pressure or vacuum, and with interchangeable furnace casings, steam jackets or oil baths for the heating method required. For mixing weak acids a vertical wood mixer is supplied with the paddle made of hard wood dowelled together while the vat has a loose bottom to facilitate renewal. Steam jackets, powerful agitators and spring steel blades for scraping the interior of the pans are fitted to the vertical cast iron mixers for blending special greases, while another interesting example of plant in the vertical range is the phosphate fertiliser mixer. The lower portion is constructed of special metal and fitted with large gate valves for discharging the acid slurry. Special renewable blades are employed for the actual mixing. A pan of tinned copper, heated by gas through a sand bath is used for the tilting pan mixer fitted with contra-paddle stirring gear for mixing thick pastes and ointments, and the stirrer continues to operate when the pan is being tilted and emptied. For washing benzine with sulphuric acid a vertical lead-lined mixer is built, with a special cone agitator. Another lead-lined mixer, provided with a steam jacket and the stirrer, can be operated at two speeds for mixtures which thicken at the end of the process.

Several of the closed type mixers are constructed for working pressures of 100 to 150 lb. per sq. inch. A typical apparatus for synthetic dye production is of cast iron with welded steel stirrer and is heated by oil bath. There is also a variety of plant for fine chemical production. A continuous plant consisting of three mixers is made for the production of solutions from liquids and solids. The solid material is fed into the first and partly dissolved, the partial solution cascades into the second and then into the third mixer, ensuring complete solution before escaping.

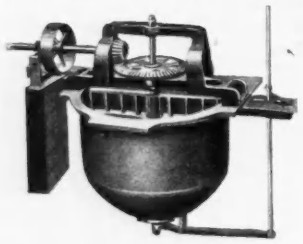
Horizontal mixers include one of mild steel for asphalt production, consisting of a semi-circular pan set in brickwork and fireheated. A very substantial mixer is built for organic acid production, made of acid resisting bronze and heated by hot oil circulating in a copper jacket. It works at a pressure of 150 lb. per sq. in. Rotating drum mixers are made for blending chemical fertilisers in large quantities, and another large scale apparatus is a continuous mixer for powdered

materials. In this case the ingredients are fed into a hopper by measuring devices, and the powders are intimately mixed by a series of rotating paddle blades which slowly transport the material to the discharge end of the machine.

An elaborate questionnaire has been produced by the firm to facilitate inquiries and to ensure that customers are provided with the most suitable and economic apparatus from their wide range of industrial chemical plant.

Crone and Taylor, Ltd.

The standard chemical mixing pot of Crone and Taylor, Ltd., Sutton Oak, St. Helens, Lancs, finds an extensive use in fertiliser factories for acidulating ground phosphate rock, bone dust, and other materials for the production of super-phosphates, etc. The heavy cast iron pot, shown in the illustration without the cover, contains a cast iron stirrer or rotating gate. Various sizes can be made to order, but the standard size has a batch capacity of 12 cwt., material being fed in through an aperture in the cover and discharged through a rubber-lined valve at the base. Edge runners manufactured by this firm include a model specially designed for grinding and mixing paints, china clay, etc., and fitted with either one or two rollers. All internal faces of the pan and the roller are machined, and extra deep scrapers and a plough are provided for thoroughly mixing and turning over the material in the pan. A special discharge scraper is provided, held out of action by a balance weight, and can be put into operation without stopping the machine. The machine proves particularly valuable where a high degree of intimacy is required in the mixing as in exact matching of colour shades.



CRONE AND TAYLOR CHEMICAL MIXING POT.

J. Harrison Carter, Ltd.

Several varieties of mixers for moist or dry substances are manufactured by J. Harrison Carter, Ltd., of Dunstable, and of Dunster House, 12, Mark Lane, London, in addition to their well-known range of disintegrating and grinding machinery. Complete plants are supplied for mixing any number of materials in any given proportion. All moving parts are of robust construction, but at the same time plant is built to eliminate the unnecessary weight and bulk too frequently found in machinery that has to stand up to strenuous work. The mixers are intended to be used on the largest scale, to work accurately and in many respects automatically. A particularly adaptable barrel mixer for dry materials is manufactured and has the advantages that it can be made to deliver at the centre or the tail end and also that the barrel can be set at any angle to the shaft. For semi-liquids there are mixers and kneaders and a double mixer, which can be arranged either for charge or continuous work. The lathe machine can also be supplied with a steam-jacket.

Oxy-Coal-Gas Lead-Burning

An attractive introduction and index to their general catalogue has been produced by the British Oxygen Co., Ltd., Angel Road, Edmonton, London, together with several additional sheets dealing with the oxy-coal-gas lead burning process and equipment. More perfect combustion and higher temperatures, it is claimed, are obtainable over the old hydrogen and air system, and an expert lead burner can turn out double the quantity of work because there are no stoppages for recharging, etc. The flame is capable of a wide range of adjustment, and by using the two sizes of blowpipes with their various nozzles all weights of lead can be burnt. The blowpipes listed on the sheet are designed to operate in conjunction with coal gas drawn from the usual town mains, but if this supply is not available many of the firm's branches can supply coal gas or hydrogen compressed into high pressure cylinders. Moreover, when cylinder gases are used the equipment is completely portable.

Trade Publications

Crompton Parkinson Publications

Recent publications by Crompton, Parkinson, Ltd., of Guiseley, Leeds, include illustrated folders dealing with their K.R.N. slip ring electric motors for crane and haulage work, Crompton ceiling fans and the "K.L.O.S.D." electric motor, which finds particular application wherever dirt, damp and fumes make difficult conditions. There is also a list of publications and an announcement dealing with the entry of Crompton-Parkinson into the lamp industry by the purchase of the Nox Electric Lamp Co., Ltd.

Forged Metal Valves

British Steam Specialities, Ltd., Fleet Street, Leicester, have issued a revised edition of the booklet dealing with their forged metal valves and fittings. The "Bossot" method of forging valves, more commonly called hot pressings, has many advantages over the old sand castings and the finished product is of more uniform and stronger metal. It has been shown that the metal solders easily, resists corrosion better than cast brass and its wearing qualities are superior to yellow brass and low grade gunmetal. In an independent laboratory test a ¾ in. "Bossot" union successfully withstood an air pressure of 1,000 lb. per sq. in.

Air Pressure Pump

A new leaflet has been prepared by the Tungstone High Pressure Die Casting Co., Market Harborough, describing their patent air-pressure pumps, which has now thoroughly proved itself as the result of practical tests in a number of industries. An exclusive feature of the pump is that by low air pressure it can lift any class of liquid to exceptional heights, and one model (of the non-immersion type) in service is daily pumping hot concentrated sulphuric acid into a tower 80 ft. high at a regular discharge of 4¼ tons per hour at only 40 lb. pressure per sq. inch. There are no pistons, stuffing glands, no working parts in contact with the liquid pumped and the maintenance cost is practically negligible.

Oil Testing Apparatus

A handsome catalogue has been produced by Baird and Tatlock (London), Ltd., 14-17, Cross Street, Hatton Garden, London, describing their apparatus for the testing and analysis of crude petroleum, petroleum products, coal tar and coal tar derivatives. All the standard instruments and accessories adopted by the various standardisation committees are listed, illustrated and priced, and there is in addition apparatus which has been found by specialists in certain industries to be practically indispensable, but which is outside the range of ordinary routine testing or has not yet been agreed upon by standardisation committees. Wherever possible the metal parts are constructed of non-rusting materials, moving parts are of hard alloys and the apparatus is designed for use in a wide range of climates.

Glazed Pantohm Resistances

The advantages of glazed pantohm resistances in electrical engineering are set out in a booklet issued by Steatite and Porcelain Products, Ltd., Stourport, Worcestershire. In their manufacture a high quality resistance wire, which is homogeneous and not liable to break and which undergoes no structural alterations when heated to 1,000° C. (1832° F.), is wound on a ceramic body or unit and is subsequently glazed by a special process at a temperature of 1,000° C. (1832° F.). The glazing protects the unit from all mechanical and chemical influences and prevents its movement. It also completely embeds the resistance wire and, owing to this intimate combination of the glazing with the resistance wire, the whole surface of the unit is utilised for dissipating the heat produced by the current. The Pantohm resistance can therefore be subjected to much higher loads than the older types and as the actual temperature to which the resistance may be heated is governed by its surroundings, the limit of temperature is a dull red heat.

Drayton dial thermometers, which are made in a large variety of types to cover practically all industrial requirements within their range of temperature, are described and illustrated in a new price list issued by the Drayton Regulator and Instrument Co., Ltd., West Drayton, Middlesex. Other recent publications deal with Drayton pressure-operated and thermostatic electric switches.

A Bookman's Column

In *Alcoholometry: An Account of the British Method of Alcoholic Strength Determination* (H.M. Stationery Office, pp. 93, 5s.), Mr. Francis G. H. Tate, of the Government Laboratory, London, has sought, as he confesses, to interest public analysts, revenue officers, those engaged in the spirit trade, and others interested in the problem of the determination of alcoholic strength. It is the first published account of the British system embodying a documented record of Sikes's works and theories based upon his own notebooks. In the historical introduction the author has been assisted by Mr. G. H. Gabb, who has contributed valuable data from material in his possession, including the history of Clarke's hydrometer (or brandy-prover) now published for the first time. Sir Robert Robertson, who permitted the author to publish extracts and reproductions from Sikes's books, contributes a short foreword, in which he commends the book as interesting to various classes of readers, including those who would like to see a presumably more "scientific" basis founded on density. Apart from its technical and scientific value, the book is interesting for its early historical notes and its illustrations.

* * *

The Colloid Symposium Annual, edited by Professor H. B. Weiser (Chapman and Hall, pp. 300, 22s. 6d.) contains the papers presented at the seventh symposium on colloid chemistry at the Johns Hopkins University in June of last year, when Professor G. G. Donnan was the guest of honour. The papers number twenty-three, and treat the subject from a wide variety of aspects.

* * *

The Measurement of Hydrogen Ion Concentration, by Dr. Julius Grant (Longmans, Green and Co., pp. 159, 9s.) is intended for the use of students and other workers in branches of science and industry, who, but for the widespread and increasing importance of the subject, might not otherwise demand a knowledge of the fundamental theoretical and practical principles on which the practice is based. The author has aimed at providing simple but adequate explanation of the theoretical side of the subject, together with detailed instructions for the actual measurements. The first wave of enthusiasm for what has been sarcastically styled "hydrogen *Ikon* worship" has, Dr. Grant naively remarks, now subsided, and discerning workers have realised that hydrogen ion concentration, if not a panacea as was once thought, at all events serves as a cure for many ills if applied with judgment and considered in conjunction with other factors. This observation serves to indicate the balanced spirit in which the book has been prepared.

* * *

The Microbiology of Starch and Sugars, by A. C. Thaysen and L. D. Galloway (Oxford University Press, pp. 326, 25s.) is a complementary volume to *The Microbiology of Cellulose, Hemicelluloses, Pectin, and Gums*, published in 1927 by Mr. Thaysen in collaboration with Mr. H. J. Bunker. Taken together, the two volumes endeavour to review the microbiology of the carbohydrates. Some idea of the extent of this field may be formed from the fact that considerably more than three thousand original publications bearing on the subject have had to be examined in detail. The volume has been written from the point of view of the research worker, and in addition to compiling existing knowledge it indicates directions in which workers may try to extend their knowledge of the action of micro-organisms on starch and sugar. While strictly scientific in spirit, the book is clearly written, and its meaning is not obscured by an excessively technical vocabulary or overelaborated formulæ.

* * *

Dr. Ernest Fyleman, who has already translated several important German text-books for publication in English, has done another competent service of this kind in translating Dr. C. A. Curtis's work *Künstliche Organische Pigmentfarben* into *Artificial Organic Pigments and their Applications*, now published by Sir Isaac Pitman and Sons (pp. 291, 21s.). The work covers this important field comprehensively, and the appendices of dyestuffs used in the pigment colour industry are a valuable feature that has been enlarged and adapted to the English market. The main applications of organic pigments are found in the varnish and printing industries, and the author pays a high compliment to the level reached by these industries in England. The volume may shortly be described as a compendium of the chemistry of synthetic and organic pigments and it has an obvious value and interest for chemists connected with paint and varnish factories.

* * *

The Cambridge University Press has done well to produce a revised and enlarged second edition of Dr. Eric K. Rideal's excellent work, *An Introduction to Surface Chemistry*, first published in 1926 (pp. 459, 21s.). The growth of the subject has been so rapid that about three-quarters of the book has been entirely re-written and about 100 pages of additional matter included. Dr. Rideal produced the first edition in the desire to assist the student of problems of colloidal behaviour. He has produced the second from a similar desire to keep abreast of the rapid growth in both the scientific study and the industrial applications of the chemistry and physics of colloidal systems. It represents an attempt—and it need scarcely be said a competent one—to revise and review our present knowledge of the properties of interfacial phases, but as in the first edition, in order to keep the volume within reasonable dimensions, the general properties of disperse systems have not been elaborated in any detail. The high opinions of the first edition expressed by Professor Donnan and other competent judges are equally applicable to the second.

Soviet Production of Insecticides

Meeting a Growing Demand

BEFORE the war Russia employed as agricultural insecticides small quantities of copper sulphate, sulphur, arsenic salts and iron sulphate. Recently the employment of chemical insecticides has encountered an obstacle in the small national production of these products. In order to take care of the growing demand, the Chemical Syndicate has just elaborated a five-year programme, fixing the consumption of the principal insecticides at the following figures, in metric tons :—

	1929–30.	1930–31.	1931–32.	1932–33.
Formaldehyde	980	1,450	2,000	2,700
Sodium arsenite ..	530	600	600	600
Calcium arsenite ..	810	1,600	2,600	3,700
Calcium arsenate..	600	1,100	2,000	2,900
Schweinfurt green	400	900	1,225	1,500
Barium chloride...	2,400	2,800	3,200	4,000
Copper sulphate...	7,100	8,150	10,000	13,000
Iron sulphate	4,700	8,400	12,000	15,000
Sulphur	2,350	4,715	7,060	10,000
Sulphur flowers ...	4,650	5,285	5,940	7,000
Carbon bisulphide	200	350	720	1,200

In order that the insecticides may be employed on a large scale, an attempt is to be made to regulate the prices at a point where these products will be within the reach of the small agricultural enterprises. The government has already made a tentative movement in this direction by fixing the price of copper sulphate at 475 roubles to the industry and 400 roubles to agriculture. The loss caused to the chemical industry by this change in price is estimated at 4,000,000 roubles.

Increased Manufacture of Paints and Varnishes in Cuba

WITHIN the last two years, the domestic production of paint products in Cuba has increased materially, and, according to a U.S. estimate, the annual output of paints and varnishes is from 200,000 to 250,000 gallons, valued at between $600,000 and $700,000. About three-fifths of this quantity is supplied by the Cia. Nacional de Pinturas "El Morro," S.A. This firm, incorporated in 1925, with a capital of $250,000, did not commence operations until two years ago. All kinds of paints varnishes, enamels, and lacquers are produced. In 1929, the total output of the factory situated in Habana was between 100,000 and 125,000 gallons and sales for the same year amounted to $350,000. It is stated that facilities of the plant can triple the present production, provided there is sufficient demand. The company recently enlarged capital invested to between $400,000 and $500,000. In addition to this factory there are two or three other important paint establishments in Cuba.

Indian Chemical Notes

[From Our Indian Correspondent.]

Among the artificial fertilisers now under trial in Burma, Ammonphos, Diammonphos and Leunaphos take the lead, and important results have recently been obtained which have now been published, by Mr. David Hendry, lately Deputy Director of Agriculture, Burma, in the *Agricultural Journal of India*. Taking Ammonphos to begin with, this fertiliser was first received from the Cyanamid Co. of New York in 1924, and plots were put down in that year to test the effect on rice of the two grades applied. These were designated 20/20 grade, containing 20 per cent. of ammonia and 20 per cent. of phosphoric acid, and the 13/48 grade, containing 13 per cent. of ammonia and 48 per cent. of phosphoric acid. Applied at the rate of 100 lb. per acre, these gave increases in the crop similar to those that would be expected from equivalent quantities of ammonium sulphate and superphosphate, while their lower cost per unit left larger net profits per acre.

These plots were allowed to continue for another two years to determine the residual effect, and it was shown that there was a residual effect in the second year. In 1927, a fuller experiment was put down to obtain further information about the fertilisers and to determine the most profitable quantities to apply. The results showed that the maximum profits came from an application of 200 lb. per acre. More recent experiments have shown that this figure is between 200 lb. and 300 lb., and is most probably about 250 lb., giving an increase in crop of from 100 to 150 per cent. and an extra profit of about Rs. 25 per acre, excluding straw.

A Comparison

As compared with these results of 20/20 grade, the results of 13/48 grade were satisfactory but on a lower scale. This was due to the smaller amount of nitrogen applied in the dressing, and although the extra phosphate gave a higher residual increase in the second year, especially with the heavier dressings, this was not sufficient to bring the net profits over the two years up to those achieved with the 20/20 grade. Here again the optimum rate of application is in the neighbourhood of 200 lb. per acre. With the heavier dressings of this fertiliser a residual effect will in all probability make itself evident in the third year, and by supplementing it by a purely nitrogenous fertiliser like sulphate of ammonia it might be made to give a better showing; but for the average cultivator this is a complication which does not recommend itself.

Diammonphos and Leunaphos

Diammonphos and Leunaphos are to each other in very much the same relation as the 13/48 grade of Ammonphos is to the 20/20 grade. Diammonphos contains 20 per cent. of nitrogen and 53 per cent. of phosphoric acid, and Leunaphos 20 per cent. of each. In the case of Leunaphos, a greater range up to 400 lb. per acre was employed, in the belief that the heaviest dressing used would prove to be excessive. The crop stood up to this dressing, however, and further increases were obtained with every additional increment of fertiliser applied up to the maximum dose. The most profitable application appeared to be about 300 lb. per acre. When the two fertilisers were tested against each other, with moderate dressings of 150 lb. per acre, it was found that as with Ammonphos the fertiliser with the higher nitrogen ratio gave the largest profit.

Relative Efficiency

An interesting and important question which arose in the course of these experiments was whether the new combined fertilisers are more efficient than the old super and sulphate combination, and whether the lower cost and convenient form of the new fertilisers constitute the whole of their superiority. To determine this, plots were put down which received equivalent quantities of N and P_2O_5 supplied in different forms. Ammonphos 20/20 has a N/P_2O_5 ratio of $1 : 1\frac{1}{2}$, and this was used as standard. Diammonphos and Leunaphos were mixed to give this ratio, and so with superphosphate and ammonium sulphate. All three were then weighed out in quantities to supply 30 lb. of nitrogen and 45 lb. of P_2O_5 per acre, and applied to plots which were replicated five times. The results indicated that the efficiency of the N and P_2O_5 in the fertilisers used is approximately the same. Both the ammonium phosphate types, however, give a much better financial return than super and ammonium sulphate.

Nitrogen: Phosphoric Acid Ratio

To settle the question of the best $N : P_2O_5$ ratio to use for the rice soils in Burma, an experiment was arranged on a field scale. Sulphate of ammonia was applied to all plots except the untreated controls at a rate to supply 30 lb. of nitrogen per acre. P_2O_5 as superphosphate was applied at 15, 30, 60, 90 and 120 lb. per acre to all plots giving ratios of $\frac{1}{2}$, 1, 2, 3 and 4. The results showed that ratios 1 : 2 and 1 : 3 give the highest crop yields for the quantities of fertilisers used, but it also confirms the conclusion that the lower P_2O_5 ratio gives a more profitable return. There is no very marked difference in returns until the 1 : 2 ratio is exceeded, and for a general purpose fertiliser for rice in these parts a 1 : 1 ratio would appear to be almost ideal.

Potash

Some mention may be made here of the effect of the addition of potash to dressings of a fertiliser containing N and P_2O_5 only. On the rice soils on which experiments have been carried out in Burma, potash has not been found to be necessary; and the addition of potash to fertilisers like Ammonphos, Diammonphos and mixtures of superphosphate and ammonium sulphate has been found merely to add to the cost of manuring without bringing about any appreciable increase in the crop or improving its condition. For the time being, therefore, potash may be left out of consideration for rice in these soils, although it is conceivable that when the use of fertilisers has become an established practice the need for potash fertilisers will be felt in the future.

Glass Industry in U.P.

The glass industry in the United Provinces is making good progress. The United Provinces Glass Works, Bahjoi, worked their sheet glass plant for the first time during the past year. They had to bring out trained workmen from foreign countries. Sheet glass of good quality has been manufactured and marketed and three new factories have been started in the province. The bangle industry at Firozabad made good progress and had almost ousted foreign bangles. Generally speaking, factories manufacturing blown-ware did well. Labour has been trained and manufacturing costs reduced. There are signs of over-production, and new lines such as jars, tumblers and bottles are being undertaken.

Leather and Tanning

The leather trade of the province, which is an important one, showed no life during the year owing to the general trade depression. A few firms in Cawnpore were fairly busy, but others scarcely obtained even an average share of business. Prices of leather remained steady during the winter but fell thereafter. The prices of foreign leather also decreased by about 20 per cent. and the shoe industry suffered in competition with cheap imported goods. The hide market was firm in the beginning of the year. The export trade was very brisk on account of the reported large orders placed by Russians with German tanners. The prices of raw skins remained stationary throughout the year. A small tannery was opened at Fatehpur. Experiments in growing *tarwar* (*cassia auriculata*) were carried out on a small scale successfully.

Soap and Oil

The manufacture of washing soap of cheap quality is steadily increasing, but a good deal of work is still to be done in the manufacture of toilet soaps. The Benares Hindu University produced toilet soaps which found a ready sale in the market. A small toilet soap plant has been installed at the Butler Technological Institute for training of students. The Excise department has also offered a concession for the supply of specially denatured spirit used in the manufacture of soaps in Meerut.

The oil industry of the province progressed favourably. The Oil Mills of Agra restarted working. Several castor seed crushing presses worked well. The Technological Institute supplies trained men for the industry.

Oil Extraction in South Africa

[From a Correspondent.]

Of late years considerable attention in South Africa has been given to the various chemical methods of conserving the oil resources of the extensive South African coal fields. A Natal engineer has invented a process by which he claims the extraction of oil from coal can be effected without great technical difficulties. Mr. T. R. Starkey's specifications were used by Messrs. J. E. Borain and Co., in building at their Congella works a model plant. Preliminary experiments with this seem to justify the inventor's conviction that with this plant he will recover 10 per cent. more from shale or oil than he would by using any plant at present in use in Europe or America. The plant just undergoing completion is intended for demonstration, but details are at present kept secret. The main feature of the invention is that after the extraction of crude oil, a residue of semi-coke for pulverising for power station use is yielded. Although ordinary pulverised coal may only be stored for up to 24 hours, this coke may be kept for a much longer period and with a greater margin of safety and more promise of efficiency.

It is anticipated that, assisted by special railway rates and better use of coal and its by-products, the South African alcohol fuel manufacturing industry may become one of the most prosperous, as much on account of side lines as for the principal product. Natal would probably be the most suitable site for such industries, but their establishment on a large scale is still so much a dream of the future that the interested British manufacturer has yet no competition.

The possibilities of processing South African coals have already attracted considerable attention. Mingled with alcohol such light oils could be made to yield a good motor spirit. Industrial alcohol, it is anticipated, will be made from bagasse, that woody matter remaining with molasses after juice has been extracted from sugar-cane, sorghum or sugar beet. The residue of this alcohol has been found readily adaptable to inexpensive manufacture of potash fertiliser, the bagasse remaining being used to make millboard fruit boxes.

Chemical By-Products

It is now being realised that a great deal of South African coal, discarded as waste for sale as dumpings to be removed as quickly and cheaply as possible, contains as much oil and chemical by-products as better class lump coal.

As in other parts of the world, South African coal mines produce various by-products, but these have failed to influence imports from overseas considerably. Sulphate of ammonium was once produced by the Natal Ammonium Co., near Vryheid, and, although there is still an abundance of the raw materials needed for such manufacture, this company failed to make the large dividends expected and has been out of business for some years now.

Ballengeich is the headquarters of the South African Carbide and By-Products Co., Ltd., which is making satisfactory progress in the production of calcium carbide and oils and spirits of a few types. In this the low carbonisation process is followed.

At the Walschbank factory of the Dundee Coal Co. a number of by-products are being manufactured on excellent commercial basis from coal. Among the products are sulphate of ammonia, tar, light creosote oil, solvent naphtha, and naphtha salts. Tar from these factories is in increasing demand for road building and other purposes in South Africa. The Dundee Coal Co. in an average year disposes of 230,000 gallons, valued at about £9,000, and the Tweefontein United Collieries, Ltd., in the Transvaal, of about 200,000 gallons valued at over £10,000. These sales do not exclude the same by-products of British collieries. The South African by-products industry enjoys no protection. Tar and pitch in bulk, subject to approval regarding standard from the Government, is admitted free of all duty.

Although mineral oil occurs in vesicles of the intrusive rocks of the Karoo, it is not expected officially or in interested business circles that a large oil producing industry will develop. The oil existing is believed to be a distillation from carbonaceous beds below. There is little hope of flowing mineral oil being found in commercial quantities.

Associated with the coal measures of the Cape, Natal and Transvaal have been found beds of oil shale up to 4 feet in thickness. The experiments carried on with these have yielded a distillate of up to 36 gallons per ton. Companies have been formed to work deposits in certain regions and to manufacture chemical by-products from them.

Much of the oil used in South African paint manufacturing has to be imported, but there are occurrences of pigments of mineral paints that have only been worked slightly. In the older rocks of the Union are found red hæmatites and ochres of numerous sorts, and also specularite. South African paint manufacturers may eventually find this of commercial value, but they have not done so yet.

Often financed by British capital the South African chemical industry now has about 140 factories producing such goods as drugs, sheep and cattle dips, insecticides, disinfectants, perfumery, oil and grease, explosives and matches, soap, paints and fertilisers. The value of land and buildings of this industry is over £1,600,000, and the machinery and plant is worth about £1,800,000. Employment is found for about 2,500 Europeans and for nearly 5000 natives, about 700 Asiatics and nearly 1,000 coloured people of both sexes.

Paint Amalgamation Approved

Fighting Increased Tariffs

Resolutions approving the scheme for the fusion of the interests of Associated Lead Manufacturers, Ltd., and Goodlass, Wall and Co., Ltd., were passed on Monday by substantial majorities at meetings in Liverpool of the Ordinary and 7½ per Cent. Cumulative Preference shareholders in Goodlass, Wall and Co., Ltd., and at London meetings of the Ordinary and 6 per cent. Preference shareholders of Associated Lead Manufacturers, Ltd.

Mr. Clive Cookson, who presided at the last mentioned meeting, said that during the last five years they had built up a company which embraced the major portion of the British manufacturers of paint and various other commodities Under the scheme Preference shareholders would receive the same amount of dividend as in the past. He explained that the decision to proceed with the amalgamation was arrived at owing to the serious drop in the price of lead. This necessitated centralisation of trading interests in order to ensure more economical production. At the meeting of the Ordinary shareholders it was stated that each holder of a £1 Ordinary share would receive shares to the value of 11s. 3d. in the new company.

The meetings of the shareholders in Goodlass, Wall and Co., Ltd., were presided over by Mr. John Byrne, chairman of the company. Mr. C. F. Spencer, a director, explained to the Ordinary shareholders that the home trade was promising, but the export trade, which meant so much to them, was decreasing owing to more intensive tariff campaigns, against which it was impossible to compete economically. The only course left appeared to be to establish factories abroad where they had a connection substantial enough to justify such a step.

China Clay Trade Decline

Drop in July Exports

The china clay industry showed a further decline in July, but there are hopeful signs that trade during the remainder of the year will improve. Most of the continental markets are two or three thousand tons below their usual monthly requirements. China clay exported to the United States during July represented slightly over 6,000 tons, or one-fifth of the average consumption. About 800 tons were sent to the various provinces of India. The details of shipments recorded during July were as follows: Fowey, 34,373 tons china clay, 3,714 tons china stone, 1,605 tons ball clay; Falmouth, 165 tons china clay; Plymouth, 215 tons china clay; Par, 3,573 tons china clay, 46 tons china stone; Charlestown, 5,034 tons china clay; Penzance, 965 tons china clay.

5,149 tons of china clay were sent by rail direct to inland manufacturing towns, representing a total of 55,108 tons, compared with 58,053 tons for the previous month. The total shipments for the present year are:—January, 100,456 tons; February, 89,984 tons; March, 77,584 tons; April, 60,455 tons; May, 72,142 tons; June, 58,052 tons; July, 55,108 tons. The shipping at Fowey in January of the present year aggregated 81,670 tons, whilst for July it did not exceed 39,691 tons.

Seitz Asbestos Filter

Rapid and Simple Application

A FILTER which is finding more and more application in the chemical industries in general and the oil industry in particular, both by reason of its simplicity in operation and its efficiency, is the Seitz Asbestos Alluviation filter, made at the Seitz Works, Kreuznach, Germany. As the illustration shows it is extremely compact. The outer case is made either of sheet iron or tinned copper and a door gives access to the filtering elements placed side by side within. These consist of frames, to which are attached on both sides fine metal gauzes, forming a chamber and also serving for the reception of asbestos. From the

THE SEITZ FILTER—TAKING OUT THE FRAMES.

inner chamber of the filtering elements run tubes for the conveyance of the out-running liquid. With the filter a mixing vessel is also required, in which the filtering material is mixed with part of the fluid to be filtered, and, by means of a pump, this fluid is pumped into the filter. The pump is only used till a layer of asbestos has been properly formed on the gauzes. One can determine the condition of the layer by the filtrate, which becomes clear when the layer is perfectly formed. From now onwards the filter can be left to run by itself. The filter works best when it is fed with the liquid to be filtered by gravity pressure of not more than 9-12 feet. The output of the system is very high. When the filter becomes choked the elements can be cleaned in a very simple manner. After emptying the filter, the door is opened, the elements taken out singly, and the adhering layers of asbestos on either side removed by simply pressing against one corner with the thumb and stripping the layers right off. Thus in a few moments the apparatus is ready for resetting and the formation of new filtering layers.

Asbestos is well suited for the purposes of filtration being very light, devoid of colouring matter, odourless and tasteless, and the amount required per square of yard filtering surface is extremely small. The sole agent for Seitz apparatus in this country is John C. Carlson, 149, Farringdon Road, London

Castleford Explosion Relief Fund

VARIOUS decisions as to the allocation of the Castleford Explosion Relief Fund, promoted by the Urban Council, have been made by the committee appointed to administer the fund. Approximately £5,000 has been set aside for the widows and dependents of the victims, this to include sums to be paid, according to a scale, to the men who were injured, or who lost their employment in consequence of the explosion. Thirty per cent. of the balance will go towards covering the cost of damage to household effects; five per cent. towards the maintenance of children in homes; five per cent. towards the cost of feeding families during the time they were away from their homes, and ten per cent. towards miscellaneous expenditure and the cost of administration.

It has been further decided that the balance of the allotment for dependents, after meeting expenses, in respect of the injured and unemployed, shall be divided into shares of £25, widows to receive five shares each, children of widows a half-share for each year up to 21 years of age, adult dependents, as distinct from widows, £26 per annum for two years, and junior dependents 1½ shares for each year up to age 21.

"White Lead Paint" Prosecution Fails

Label Justified by Analysis

ON Tuesday, the hearing was concluded of a charge at the Lambeth Police Court, against a firm of paint manufacturers, of selling paint to which a false trade description had been applied, and of applying a false trade description to the articles. The summonses had been brought by the White Lead Paint Section of the London Chamber of Commerce, against E. B. Blackwell, Ltd., of 21–23, Bedford Road, Clapham, paint, varnish and enamel manufacturers, and came under Section 2 (2) 3 and 5 of the Merchandise Marks Act, 1887.

There had been a plea of not guilty. At the last hearing it was stated that the defendant company had entered into contract to supply the Hamilton Trading Co., Ltd., with 1,000 14 lb. tins of superfine white paint, containing genuine English stack white lead at 4s. 5d. a tin. Four orders were given to the Hamilton Trading Co., for white lead paint, and on analysis the maximum amount of lead in one sample was found to be 6·88 per cent., whereas it was intended the pigment should have consisted practically of white lead. Counsel for the prosecution said his witnesses would give evidence as to what they would infer from a label "Superfine White Paint, containing genuine English stack white lead," but it was held that that was a point for the magistrate to decide.

On Tuesday, Mr. E. B. Blackwell, managing director of the defendant company, produced the formula of the manufacturer of the paint, which showed that each tin should contain at least 5 per cent. white lead. Mr. W. Marco Seaber, B.Sc., F.I.C., partner of the firm of Salamon and Seaber, consulting and analytical chemists, said he analysed two samples, and found the white lead content to be 5·4 per cent. and 5·6 per cent. According to the formula, 36 lb. of white lead would represent a percentage of 5·2 in the whole paint. Mr. Harley F. Knight, F.I.C., a partner of Knight and Chapman, consulting chemists, said his analysis showed the white lead content to be 5·28 and 5·63 per cent. In cross-examination he said he did not ascertain how much barytes was in the paint, or zinc sulphide, zinc oxide, or calcium carbonite, as he was instructed to look for lead. In the formula there were 168 lb. lithopone, and he agreed that lithopone would contain lead, but he would put it at much less than 2 per cent., although undoubtedly some of the lead content could be traced to the lithopone.

In giving his decision, Mr. McKenna said that he had to construe the label on the paint. He had come to the conclusion that it meant that the paint contained genuine English stack white lead, and that that description was satisfied by the inclusion in the compound of the white lead. In the first case it was said there was only a colourable amount of lead which was not substantial, but after hearing the evidence that there was something like 5 per cent. in those samples, he thought it satisfactory. Therefore the prosecution must fail.

Mr. Measor: Is your judgment, then, that 5 per cent. is a proper quantity of lead?

Mr. McKenna: My view is that the paint produced satisfies the description upon the label.

Mr. Lasky asked for costs, saying that the case had been very expensive, and pointed out that in a summons at the Tower Bridge Police Court, the prosecution were allowed £25 costs.

Mr. McKenna said he would allow 30 guineas costs.

Mr. Measor asked for a case to be stated, saying that the interpretation of the label was a question of law, and there were also other questions of law.

Growth of Chemical Industry of Marseilles

THE chemical industry in Marseilles and vicinity has increased in importance within recent years, as indicated, for example, by sulphur production of about 90,000 tons in 1929 for use chiefly in vineyards, and by salt production of about 300,000 tons, sulphate of soda production of about 32,000 tons, as well as a quantity of calcium chloride. Other production included 170,000 tons of sulphuric acid, about 20,000 tons of other mineral acids, 210,000 tons of superphosphate of lime, and sulphate of iron and copper 57,000 tons. Much of the salt found in the district is shipped to the interior of the country, but roughly two-thirds of the production of chemicals remains in this region.

From Week to Week

SIR FELIX BRUNNER'S residence, Rudloe Farm, an early seventeenth-century manor house between Bath and Chippenham, is for sale.

RAYON YARN and waste produced in Great Britain during July amounted to 5,020,000 lb., against 4,040,000 lb. in June and 5,730,000 lb. in July, 1929.

A DISCOVERY OF LITHIUM is announced from the Marienthal district of South West Africa. The general average of lithium oxide in four samples is 4·59 per cent., one sample showing nearly 6 per cent.

A SWEDISH NEWSPAPER has published a message from Lima, to the effect that the Government of Peru has issued a decree cancelling the match monopoly, and cancelling the agreements with the Swedish Match Trust. It is reported that the Swedish Match Trust has received several cables regarding the situation in Peru, but they have heard nothing of the decree referred to.

THE DIRECTORS of Castlebank Dyeworks, Glasgow, have created a scheme of co-partnership for the benefit of their principal employees, while a fund inaugurated at the business jubilee of the founder of the firm, Mr. Alexander Kennedy, has been added to for the purpose of providing a dowry to be presented on marriage to every employee of four years' service or over.

SUBJECTS to be discussed at the Second Convention of the British Glass Industry to be held at Buxton from September 17 to 20, under the presidency of Mr. Walter Chance, chairman of Chance Brothers and Co., Ltd., include "Elimination of Waste in the Glass Industry" (Dr. Miles), "Marketing Methods in the Glass Industry" (Sir Francis Goodenough), and "Publicity and Propaganda in the Glass Industry" (Mr. H. Gordon Selfridge).

IMPORTS OF FOREIGN BITUMEN into this country are steadily declining, and last month only 14,237 tons were imported from the United States, Mexico and other foreign countries, as compared with 20,500 tons for the same period last year and 23,670 in 1928. The increased use of British tar on the roads is held responsible for the decline, but during the first seven months of this year nearly 113,000 tons were imported, representing a sum of £543,000.

EXPERIMENTS have been made at Kaiserslautern, in Bavaria, with the object of testing the possibilities for defence of a town attacked by poisonous gas bombs. All kinds of the most modern gas masks and resuscitation appliances were used, while the bombs dropped by aircraft were supposed to contain various kinds of poison gas. The tests occupied three hours, and were concluded with a real gas attack, in which irritation gas was used. They were watched closely not only by the Bavarian military authorities, but also by chemical and other experts from Berlin and Hamburg.

AN EXPLOSION took place on Thursday, August 22, at the refractories research laboratories, formerly used by the Mines Research Board at Sheffield University Applied Science Department. Mining switchgear was being tested in a gas filled chamber specially constructed to withstand pressure, and the pressure proved too strong. The front of the chamber was blown into the laboratory. The explosion wrecked the glass roof, damaged the apparatus under test, and slightly damaged the laboratory walls. Nobody was hurt, as no member of the staff was present in the room during the experiment, which was being operated from an adjoining laboratory.

A MEETING of the principal creditors of the Atlas Artificial Silk Co. was held on Tuesday, when a receiver was appointed by the debenture holders. Mr. Brandwood, a director of the company, stated that negotiations were in progress for the provision of further capital, and it was probable that the necessary funds would be forthcoming by the end of September, when the creditors' claims would be discharged. After a long discussion a committee of creditors was appointed to confer with the directors upon the position generally and to report to a subsequent meeting of creditors. A meeting of execution creditors followed, at which, owing to the refusal of certain creditors to withdraw from possession, the receiver was appointed.

VACANCIES advertised elsewhere in this issue include posts for chemists with experience in the manufacture of aluminium sulphate and fine chemicals.

WORKPEOPLE KILLED during the course of their employment in the chemical industry of Great Britain and Ireland during July numbered 18, out of a total for all industries of 185.

GAS made in Great Britain last year showed an increase of 2·2 per cent. over the 1928 total and 325,000 more tons of coal were carbonised. The quantity of coke and breeze made increased by 233,000 tons.

THE STANDING COMMITTEE appointed by the Board of Trade will hold an inquiry at 11.30 a.m. on October 6 and at 10.30 a.m. on October 7, as to whether imported fertilisers or feeding stuffs should be required to bear an indication of origin. The inquiry will be held at the Board of Trade offices, Great George Street, S.W.1. Communications should be addressed to the secretary, Mr. E. W. Reardon, at that address.

AN INQUEST was held at Dublin last week into the death of a foreman at the Bell dyeing and cleaning works, who was found unconscious in a benzine tank and suffering from benzine vapour poisoning and burns. It was stated that he had been warned previously about entering the tank, and in recording a verdict of "death from burns accidentally received," the coroner stated that the dead man had taken the risk himself.

THE FOLLOWING AWARDS for the year 1930–1931 have been made by the Salters' Institute of Industrial Chemistry, and approved by the Court of the Salters' Company: A fellowship has been renewed to D. L. Hodge, of the Imperial College, London. Fellowships have been awarded to G. H. Abbott, Jesus College, Oxford; D. J. Branscombe, University College, Exeter; H. G. Simpson, East London College, and J. Hofton, Caius College, Cambridge.

THE SCOTTISH FEDERATION OF EMPLOYERS has given the necessary notice to the Amalgamated Society of Dyers, Bleachers, Finishers and Kindred Trades to terminate the present running wages agreement at the end of September. This agreement has been in operation—subject to amendment—for a period of six years, and affects the wages and conditions of work of between 7,000 and 8,000 operative dyers in Scotland. The staffs in dyeing and cleaning works are not affected, their wages being governed by what is known as the London agreement.

THE ECONOMIC MISSION TO THE FAR EAST, the formation of which was recently announced by Mr. G. M. Gillett, M.P., will leave this country on September 19 next. The terms of reference of the Mission are "to inquire into the present conditions of British trade with China and Japan, and to report what action should be taken to develop and increase that trade." Its personnel is as follows: Sir Ernest Thompson (chairman), Sir Thomas Allen, Mr. James Bell, Mr. William A. Crowther, Lieut. Colonel Reginald Morcom, Mr. Louis Beale, Mr. T. St. Quintin Hill (secretary) and Mr. F. A. Barnes (assistant secretary). The Mission desires to have the views of those interested in Far Eastern trade as to the problems which the Mission should examine, and these should be sent as soon as possible to the Department of Overseas Trade, 35, Old Queen Street, S.W.1.

THE FINAL STAGES, it is announced, have been reached in the preparation of the big expansion programme of the Ruhr Chemical Company, the concern formed two years ago by the leading heavy industries of the Ruhr to produce synthetic nitrate fertilisers from waste coke-oven gas. By October, it is announced, the company will have increased the capacity of its plant at Holten, on the Rhine, from 20,000 tons to 55,000 tons of nitrate annually. It is estimated that a practically unlimited supply of gas—approximately nine thousand million cubic metres annually—is produced as a by-product from the Ruhr coke-ovens, available for conversion into synthetic nitrate fertilisers or for sale as industrial or domestic gas. Production of synthetic nitrate fertilisers in Germany has multiplied rapidly in recent years. While output in 1913 amounted to only 12,000 metric tons, it had increased by 1929 to 677,000 tons.

Obituary

Mr. A. Macdonald, of Highgate, formerly a partner in J. F. Macfarlane and Co., chemical manufacturers, of London and Edinburgh, on August 15, aged 80.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Accepted Specifications

331,185. ALDEHYDES, KETONES AND ALCOHOLS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 18, 1929.

Vaporised α-oxides are passed over catalysts consisting of oxy-acids of elements of the fifth or sixth group, or anhydrides or salts of these acids, except those compounds which are unstable or volatile under the working conditions. Temperatures of 150°—450° C. are employed, and the pressure may be reduced, normal, or increased. The catalysts may be deposited on carriers or may be mixed with inert materials. Phosphates and sulphates are suitable, and these may be mixed with oxides, hydroxides or carbonates, in which case the mixture may be reduced with hydrogen before use. The products are aldehydes, ketones, and unsaturated alcohols. Examples include (1) passing 1 : 2-propylene oxide vapour over a mixture of magnesium pyrophosphate and kieselguhr at 260° C. to obtain propionaldehyde, allyl alcohol and acetone, (2) passing the same vapour over a mixture of cerous sulphate after heating 300° C., with barium hydroxide, to obtain propionaldehyde, (3) passing butylene oxide consisting mainly of the 2 : 3-oxide at 250° C. over the catalyst used in (2) to obtain *n*-butyraldehyde, isobutyraldehyde, methyl-ethyl-ketone and butenols ; (4) treating bytylene oxide consisting mainly of the 1:2-oxide as in (3) to obtain butyraldehyde, methyl-ethyl-ketone and butenols, (5) passing ethylene oxide at 80°—200° C. over a catalyst obtained from copper carbonate and magnesium ammonium phosphate to obtain acetaldehyde.

331,186. POLYMERISING OLEFINES. H. D. Elkington, London. From Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij, 30, Carel van Bylandtlaan, The Hague, Holland. Application date, March 18, 1929.

Ethylene and its homologues, *e.g.*, mixtures obtained by cracking mineral oils or destructively hydrogenating carbonaceous materials, are polymerised by heating under pressure in the absence of a catalyst but in the presence of an inert liquid such as mineral oil, vegetable oil, and products obtained from these. Thus, ethylene may be heated with paraffin oil to 420° C. at a pressure of 45 atmospheres to obtain benzine.

331,195. ORGANO-ARSENIC COMPOUNDS. Sir G. C. Marks, London. From Parke, Davis and Co., 2951, Atwater Street, Detroit, Mich., U.S.A. Application date, December 22, 1928.

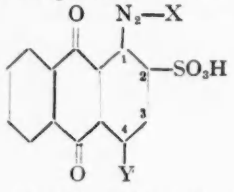
An organic arsinic acid or salt is treated with a mercaptocarboxylic acid or salt to obtain therapeutic products. Examples described the preparation of sodium 3-amino-4-hydroxy-phenylarsinic acid-tetrathioglycollate, sodium-phenylglycinamide-4-arsinic acid-tetrathioglycollate, sodium-3-nitro-4-hydroxy-phenyl-arsinic acid-dithiolglycollate, the monocystein derivative of arsanilic acid, and the monocystein derivative of phenyl-glycinamide-4-arsinic acid.

331,216. TANNING AGENTS. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 25, 1929.

To obtain water-soluble tanning agents, resorcinol or pyrogallol 3 molecular parts, is condensed with benzaldehyde or a substitution product of 1—1·5 molecular parts, in an aqueous medium in presence of a small amount of acid. The reaction is interrupted by neutralizing the acid when little or no phenol can be detected, the progress of the reaction being followed by the colour given by very dilute test portions with ferric cholride. In an example, a mixture of resorcinol, benzaldehyde and water is raised to 40° C. and then neutralised, concentrated in vacuo, and freed from aldehyde by treating with bisulphite. Other examples are given. The products may be used to increase the tanning action of other synthetic or vegetable tanning substances.

331,217. DYES. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 25, 1929.

A diazo compound of the general formula—



in which X represents an acid residue and Y represents a halogen or an arylamine group, is treated with an amine of the general formula $R_1NH\,R_2$ in which R_1 represents hydrogen or an alkyl group, and R_2 an alkyl, cyclo-alkyl, aralkyl or aryl group. Acid wool dyestuffs are obtained. Catalysts such as copper, zinc, magnesium, or their compounds, and diluents such as benzene or nitrobenzene, may be used. Diazoamino compounds are first formed and then decomposed with evolution of nitrogen into compounds in which the 1- and/or 4-positions of the anthraquinone nucleus are occupied by the substituted amino group. These replacements vary with reacting conditions and with the amine employed, but usually the 1-position is first replaced, so that a substituted amino group may be first introduced into one of these positions and then the same or a different amino group may be introduced into the other position. In an example, 1-diazo-4-bromo-anthraquinone-2-sulphonic acid is treated with aniline, hexahydro-aniline, and mono-ethyl-aniline in the presence of copper powder. Other amines and catalysts may also be used. Other examples describe the treatment of moist 1-diazo-4-bromo-anthraquinone-2-sulphonic acid with aniline in acetic acid, and the resulting diazo-amino compound with aniline, copper sulphate and sodium carbonate, and also the treatment of diazotised 1-amino-4-phenylamino-anthraquinone-2-sulphonic acid with aniline containing copper powder. The preparation of 1-diazo-4-bromo-anthraquinone-2-sulphonic acid is also described.

331,236. POTASSIUM NITRATE AND CHLORIDE, AND SODIUM NITRATE. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 25, 1929.

Mixtures containing potassium chloride or nitrate or sodium nitrate are treated with liquid ammonia, which may contain ammonium nitrate, to vary the solubility of these salts and separate them. Thus, when a mixture of potassium and sodium chlorides is treated with liquid ammonia the undissolved residue contains a greater proportion of potassium chloride. In another example, potassium chloride and ammonium nitrate react to produce a mixture of potassium nitrate and ammonium chloride, which when treated with liquid ammonia containing ammonium nitrate leaves an undissolved residue of potassium nitrate.

331,247. DYES. O. Y. Imray, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 21, 1929.

Azo dyes made in substance or on a substratum by coupling a diazo, tetrazo, or diazo-azo compound free from sulphonic or carboxylic groups with a 2(2^1-hydroxy-3^1-naphthoyl-amino)-5-halogen-1 : 4-dimethoxy-benzene. Examples are given of the coupling of the chloro and bromo derivatives with 2 : 5-dichlor aniline, 5-chlor-2-toluidine, *p*-xylidine and 4-chlor-2-toluidine. The shades obtained with these and with a number of other components are given. The preparation of 2-(2^1-hydroxy-3^1-naphthoyl-amino)-5-halogen-1 : 4-dimethoxy-benzenes is also described.

331,260. CELLULOSE ESTERS. H. W. Hereward, Cartref, Polmont, Stirlingshire, P. O. Hereward, St. Andrews, Whyteleafe, Caterham, Surrey, and G. B. Ellis, London. From Soc. des Usines Chimiques Rhône-Pouleno, 21, Rue Jean Goujon, Paris. Application date, September 31, 1928. Addition to 328,588.

Cellulose or a near transformation is treated with crotonic

aldehyde in the presence of acetic and a catalyst such as sulphuric acid, aromatic aliphatic sulphonic acids such as methane sulphonic acid, acid salts, zinc chloride, or perchlorates. Solvents and diluents may be present. Mixed esters are obtained, and examples describe diaceto-monocrotonates and esters containing less than 10 per cent. of combined acetic acid. The latter resemble pure crotonates and are soluble in benzene and benzene-alcohol. The products give strong transparent films.

331,265. POLYMERISING LIQUIDS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 23, 1929.

In the polymerisation of volatile liquids such as butadiene, isoprene, dimethyl-butadiene, vinyl bromide, styrol or indene, the polymerising agent is contained in a chamber connected to another chamber into which the liquid distils when a violent reaction occurs, and from which it is afterwards returned. The polymerising chamber A is immersed in a bath H1, and is connected to a tubular condenser B, so that

FIG.1.

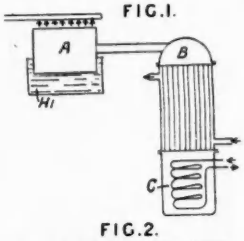
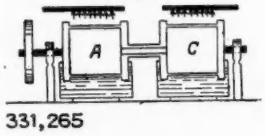


FIG.2.



331,265

the distilled liquid is collected in a receiver C and then returned to the chamber A. The condenser is at a temperature slightly higher than that of the bath H1. In a modification, butadiene and sodium are contained in a rotary cylinder A connected to a receiving cylinder C, each being immersed in a water bath maintained at about 40° C.

331,269. DYES AND INTERMEDIATES. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 26, 1929.

A 1 : 9-pyrazole-anthrone, thiazol-anthrone or -anthrapyrimidone containing a methyl group in the 2-position is treated with an alkaline condensing agent to obtain vat dyes or intermediates. In the products two molecules of starting material are linked through an ethylenic linkage—CH=CH—. In an example, 2-methylpyrazol-anthrone is heated with aqueous or alcoholic potash to obtain 2 : 2^1-dipyra zol-anthronyl-ethylene. This product may be alkylated by dialkyl sulphates in aqueous alcoholic solution or aryl-sulphonic acid alkyl-ester in an organic diluent in presence of an acid binding agent to obtain two isomeric N-alkylated derivatives. The separation of these derivatives is described. Other examples are given of the treatment of 2-methyl-pyrazol-anthrone with benzyl chloride and the condensation of the N-benzyl derivative with alcoholic potash and subsequent sulphonation. In another example, 2-methyl-pyrazol-anthrone is dissolved in sulphuric acid, nitrated, and reduced to the amino compound, which is then condensed with aqueous potash to obtain 4 : 4^1-diamino-2 : 2^1-dipyrazol-anthronyl-ethylene. Other examples describe the condensation of 2-methyl-thiazol-anthrone, and 2-methyl-anthrapyrimidone with alcoholic potash.

NOTE.—Abstracts of the following specifications, which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention :—306,512 (Soc. l'Air Liquide Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude), relating to manufacture of oxygenated organic compounds, see Vol. XX, p. 432 ; 380,740 (I.G. Farbenindustrie Akt.-Ges.), relating to manufacture of isatins, see Vol. XX, p. 546 ; 310,425 (I.G. Farbenindustrie Akt.-Ges.), relating to recovery of copper from spent copper lyes, see Vol. XX, p. 620.

Specifications Accepted with Date of Application

305,545. Purifying from naphthalene the distillation gases of coal. Gewerkschaft M. Stinnes. February 6, 1928.

306,138. Continuous process for preparing normal butyl alcohol and acetone by fermentation. Commercial Solvents Corporation. February 17, 1928.

309,379. Vat dyestuffs, Manufacture of. I.G. Farbenindustrie Akt.-Ges. April 7, 1928.

309,498. Organic products, Manufacture of. D. Futacchi. April 11, 1928.

309,998. Iron ores, Reduction of. A. Langer. April 19, 1928.

310,549. Decomposition of thiocyanic acid and its salts, Apparatus for. C. J. Hansen. April 28, 1928.

310,812. Surface plating of metals with alloys. Research Corporation. April 30, 1928.

310,919. Magnesium hydrate tablets, Preparation of. Milnesia International, Inc. May 3, 1928.

311,280. Hydrogenation of gases derived from low-temperature distillation of solid fuels. Compagnie International pour la Fabrication des Essences et Petroles. May 8, 1928.

311,404. Purification of distillation gases. Cheminova Ges. zur Verwertung Chemischer Verfahren. May 11, 1928.

312,050. Hydrocarbons of high boiling point range from coal, shale and other bituminous substances, Production of. I.G. Farbenindustrie Akt.-Ges. May 18, 1928.

312,069. Accelerating the vulcanisation of natural or artificial varieties of rubber. I.G. Farbenindustrie Akt.-Ges. May 18, 1928.

314,977. Phosphoric acid and products containing phosphoric acid, Manufacture of. Aktiebolaget Kemiska Patenter. July 7, 1928.

314,999. Chemical synthesis, Method and apparatus for carrying out. Hirsch, Kupfer-und Messingwerke Akt.-Ges. July 6, 1928.

316,945. Synthetic liquid fuels. Compagnie Generale des Produits de Synthese. Aug. 6, 1928.

316,987. Complex borofluoro organic acids and salts thereof. I.G. Farbenindustrie Akt.-Ges. August 7, 1928.

318,991. Cracking oils, Process and apparatus for. R. E. Wilson and R. J. Dearborn. September 15, 1928.

319,762. Pure anthracene, processes for producing. Rutgerswerke Akt.-Ges. and L. Kahl. September 29, 1928.

333,165. Vat dyestuffs containing halogens, Manufacture of. I.G. Farbenindustrie Akt.-Ges., and J. Y. Johnson. April 22, 1929. Addition to 287,050 and 287,845.

333,173. Phenanthridone-homologues, derivatives, and substitution products, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) May 2, 1929.

333,174. Accelerating the vulcanising of natural and artificial varieties of rubber. A Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) May 2, 1929.

333,188. Water-soluble dyestuffs of the anthraquinone series, Preparation of. Chemische Fabrik vorm. Sandoz. November 27, 1928.

333,327. Rendering austenitic nickel-chromium steels non-corrodible, Process for. W. H. Hatfield and H. Green. February 5, 1929.

333,241. Heating of liquids capable of being decomposed, Apparatus for. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) February 8, 1929.

333,246. Electrolytic deposition of gold. W. F. Grupe. May 3, 1929.

333,297. Removing naphthalene from coal distillation gases, Processes for. Gewerkschaft M. Stinnes. February 6, 1928.

333,264. Denitrating mixtures of nitric acid and sulphuric acid and concentrating nitric acid, Method and apparatus for. Hercules Powder Co. October 26, 1928.

333,313. Aromatic oxyaldehydes, Manufacture of. J. D. Riedel-E de Haen Akt.-Ges. May 18, 1929. Addition to 285,451 and 290,649.

333,322. Cupola furnaces. J. E. Fletcher and British Cast Iron Research Association. May 24, 1929.

333,335. Converting high boiling hydrocarbons into low boiling hydrocarbons. H. D. Elkington. (*Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij*). June 7, 1929.

333,349. Secondary and tertiary amines, Separation of mixtures of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) June 28, 1929.

333,352. Purifying naphthalene. Ges. für Teerverwertung, A. Spilker and G. Spilker. July 1, 1929.

333,353. Non-caustic calcium cyanamide, free from dust, Production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) July 1, 1929.

333,453. Hydrocarbons from naphthalene, Production of. J. Varga. October 13, 1928.

333,462. Electrolytic deposition of gold and silver. A Mozer. December 11, 1928.

333,466. Welding of copper. W. Andrews and Imperial Chemical Industries, Ltd. November 2, 1929.

333,477. Materials containing phosphorus and nitrogen, suitable for use as fertilisers, Production of. Hydro Nitro Soc. Anon. December 1, 1928.

Applications for Patents

[In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.]

Amber Size and C emical Co., Ltd. Production of tars. 24,724. August 18. (Germany, August 16, 1929.)
Bucherer, H. T. Producing dyes, etc. 24,816. August 19. (Germany, August 19, 1929.)
Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of conversion products of hydrocarboms. 24,809. August 19.
—— Manufacture of sulphur dyestuffs. 24,915. August 20.
—— Manufacture of vat dyestuffs of the anthraquinone series. 24,916. August 20.
—— Manufacture of indigoid dyestuffs of the anthraquinone series. 24,917. August 20.
—— Preserving rubber, etc. 25,175. August 22.
—— Manufacture of wetting agents. 25,176. August 22.
—— Manufacture of 4·5-dimethyl-7-chloro-oxythio-naphthene, and of indigoid dyestuffs therefrom. 25,177. August 22.
—— Manufacture of polyhalogen anthraquinone acridones. 25,178. August 22.
—— Manufacture of vat dyestuffs. 25,242. August 23.
Challenor, W. A. P. Chemical processes. 24,764. August 19.
Cockram, C., and Holroyd, R. Destructive hydrogenation. 24,803. August 19.
Coley, H. E. Manufacture of xinc oxide. 25,160. August 22.
—— Reduction of ores, oxides, etc. 25,161. August 22.
—— Separation of metals from ores, etc. 25,162. August 22.
Dootson, P., and Imperial Chemical Industries, Ltd. Purification of red dyestuff. 25,135. August 22.
—— Perylene dyestuffs. 25,136. August 22.
Du Pont de Nemours and Co., E. I. Production of artificial resins. 24,919. August 20.
Elkington, H. D., and Naamlooze Vennootschap De Bataafsche Petroleum Maatschappij. Absorbing ethylene by strong acids, etc. 25,044. August 21. (June 4, 1929.)
Groves, W. W., and I.G. Farbenindustrie Akt.-Ges. Manufacture of azo-dyestuffs. 24,675. August 18. (July 10, 1929.)
—— Manufacture of azo-dyestuffs. 24,824. August 19. (July 10, 1929.)
—— and Soc. of Chen ical Industry in Basle. Manufacture of disperse systems. 24,819. August 19.
Hellthaler, T. Manufacture of oxidation products of hydrocarbons. 24,823. August 19.
I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of lubricating oils. 24,665. August 18.
—— Manufacture of hydrocarbons of high boiling point. 24,666. August 18.
—— Manufacture of azo-dyestuffs. 24,675. August 18. (July 10, 1929.)
—— Manufacture of lubricating oils. 24,732. August 19.
—— Manufacture of conversion products of hydrocarbons. 24,809. August 19.
—— Manufacture of azo-dyestuffs. 24,824. August 19. (July 10, 1929.)
—— Manufacture of hydrocarbons, etc., from gas mixtures. 24,934. August 20.
—— Activation of proteases. 24,935. August 20.
—— Apparatus for fusing quartz, glass, etc. 24,936. August 20.
—— Manufacture of hydrogen. 24,937. August 20.
—— Degradation of albumen. 24,938. August 20.
—— Separation from gas mixtures of substances having high vapour pressure at melting point. 24,939. August 20.
—— Manufacture of oxidation products of anthraquinone series. 24,940. August 20.
—— Manufacture of condensation products. 24,941. August 20.
—— Conversion of crude phosphates into phosphates soluble in water, etc. 25,022. August 21.
—— Manufacture of polymerization products. 25,023, 25,024. August 21.
—— Apparatus for destructive hydrogenation of solid fuels. 25,025. August 21.
—— Manufacture of shaped articles from metal powders. 25,026. August 21.
—— Manufacture of hydrocyanic acid, etc. 25,027. August 21.
—— Purification of paraffin wax. 25,028. August 21.
—— Manufacture of metallic masses from pulverulent initial materials. 25,111. August 22.
I.G. Farbenindustrie Akt.-Ges. Manufacture of anti-halation dyestuffs. 24,671. August 18. (Germany, August 16, 1929.)
—— Manufacture of water-soluble derivatives of cellulose, etc. 24,821. August 19. (Germany, August 19, 1929.)
—— Spinning acid solutions of silk fibroin. 24,905. August 20. (Germany, August 31, 1929.)
Imperial Chemical Industries, Ltd. Collection of sulphur from gases or vapours. 24,690. August 18.
—— Chemical processes. 24,764. August 19.
—— Manufacture of styrene, etc. 24,800. August 19. (United States, August 20, 1929.)
—— Production of sulphur from sulphur dioxide. 24,801. August 19.
—— Production of colouring matters. 24,802. August 19.
—— Destructibe hydrogenation. 24,803. August 19.
—— Refining hydrocarbon oils. 24,804. August 19.
—— Manufacture of polymerized vinylnaphthalene and of moulding compositions, etc., therefrom. 24,920. August 20. (United States, August 21, 1929.)
—— Manufacture of rubber. 25,046. August 21. (United States, August 22, 1929.)
—— Cellulose-derivative coating-compositions. 25,047. August 21. (United States, August 22, 1929.)
—— Rubber vulcanisation accelerators, etc. 25,048. August 21.
—— Vulcanisation accelerators. 25133, 25134. August 22
—— Cellulose derivative coating-compositions. 25,137. August 22. (United States, August 23, 1929.)
—— Insecticides. 25,203. August 23.
—— Purification of gases. 25,204. August 23.
Kelly, A. Manufacture of boric acid. 24,942. August 20.
Mentzel, A. Manufacture of sodium bicarbonate, etc. 25,041. August 21. (Germany, August 23, 1929.)
—— Manufacture of sodium nitrate. 25,173. August 22. (Germany, August 31, 1929.)
Nicholson, A. D. Production, etc., of colouring matters. 24,802. August 19.
Plant, J. H. G. Catalytic processes. 24,893. August 20.
Tyrer, D. Production of sulphur from sulphur dioxide. 24,801. August 19.

Simple Carbon Monoxide Detector

Many Possible Uses

An ampoule type of carbon monoxide detector has recently been tested by the Pittsburgh Experiment Station of the United States Bureau of Mines for sensitivity and reliability. This detector consists of an easily crushed cotton-covered ampoule filled with a solution which changes colour when exposed to air containing carbon monoxide. In appearance the ampoule is similar to those filled with aromatic spirits of ammonia for giving inhalation treatment or those filled with iodine for use in first-aid treatment of wounds. In use the carbon monoxide ampoule is crushed, and wets the cotton covering with the solution. It is then exposed to the air to be tested. After a prescribed period of exposure, the colour is compared to a chart and the amount of carbon monoxide estimated.

This detector was devised primarily for examining the air of man-holes and sewers for possible dangerous contamination with carbon monoxide before workmen enter these places, but owing to the simplicity of the device it may have a more general usage for examination of atmospheres which are known or suspected to be contaminated with carbon monoxide. Some of the suggested uses are the examination of the air in garages, tunnels, mines, around blast furnaces and gas plants, and in the home.

Effect of Temperature

In the tests made by the Bureau of Mines it was found that the detector gave semi-quantitative indications of carbon monoxide in a range of concentrations of 2 to 10 parts in 10,000 parts by air by volume when the temperature of the air was above 50° F. The sensitivity of the detector was found to decrease with low air temperatures. A longer period of exposure than the prescribed 10 minutes was required to give a satisfactory indication of the amount of carbon monoxide. For temperatures of 50° to 32° F., a period of 20 to 30 minutes was required and at 0° F. the reaction was retarded to an extent that satisfactory indication was not produced by 30 minutes exposure of the ampoule.

It was also found that gasoline vapour, ethylene, hydrogen, and hydrogen sulphide produced a change in the colour of the ampoules, similarly to carbon monoxide. The concentrations of these gases which produced the change were dangerous from the hazard of poisoning or of explosion.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID, CHROMIC.—1s. 0¾d. per lb. d/d U.K.

ACID HYDROCHLORIC.—Spot, 3s. 9d. to 6s. per carboy d/d, according to purity, strength and locality.

ACID NITRIC, 80° Tw.—Spot £20 to £25 per ton, makers' works according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA (ANHYDROUS).—Spot, 11d. per lb., d/d in cylinders.

AMMONIUM BICHROMATE.—8d. per lb. d/d U.K.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.

BLEACHING POWDER, 35/37%.—Spot, £7 10s. per ton d/d station in casks, special terms for contracts.

BORAX, COMMERCIAL.—Crystals, £13 10s. per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags carriage paid any station in Great Britain. Prices quoted are for one ton lots and upwards).

CALCIUM CHLORIDE (SOLID), 70/75%.—Spot, £4 15s. to £5 5s. per ton d/d in drums.

CHROMIUM OXIDE.—9½d. and 10d. per lb. according to quantity d/d U.K.

CHROMETAN.—Crystals, 3½d. per lb. Liquor, £18 10s. per ton d/d U.K.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 7d. to 1s. 11d. per gall. pyridinised industrial, 1s. 9d. to 2s. 1d. per gall.; mineralised 2s. 8d. to 2s. 11d. per gall. 64 O.P., 1d. extra in all cases. Prices according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE CRYSTALS AND GRANULAR.—4½d. per lb. nett d/d U.K., discount according to quantity; ground ½d. per lb. extra.

POTASSIUM CHLORATE.—3¾d. per lb., ex-wharf, London, in cwt. kegs.

POTASSIUM CHROMATE.—8d. per lb. d/d U.K.

SALAMMONIAC.—Firsts lump, spot, £42 10s. per ton d/d station in barrels. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE, UNGROUND.—Spot, £3 7s. 6d. per ton d/d station in bulk.

SODA ASH, 58° E.—Spot, £6 per ton, f.o.r. in bags, special terms for contracts.

SODA CAUSTIC, SOLID, 76/77°E.—Spot, £14 10s. per ton, d/d station.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton, d/d station or ex depot in 2 cwt. bags.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE, REFINED.—Spot, £10 10s. per ton d/d station in bags.

SODIUM BICHROMATE CRYSTALS.—3¾d. per lb. nett d/d U.K., discount according to quantity. Anhydrous ¾d. per lb. extra.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.b. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM CHROMATE.—3¼d. per lb. d/d U.K.

SODIUM NITRITE.—Spot, £19 per ton, d/d station in drums.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SILICATE, 140° Tw.—Spot, £8 5s. per ton, d/d station returnable drums.

SODIUM SULPHATE (GLAUBER SALTS).—Spot, £4 2s. 6d. per ton, d/d address in bags.

SODIUM SULPHIDE SOLID, 60/62%.—Spot, £10 5s. per ton d/d station in drums. Crystals—Spot, £7 10s. per ton d/d station in casks.

SODIUM SULPHITE, PEA CRYSTALS.—Spot, £13 10s. per ton, d/d station in kegs. Commercial—Spot, £9 per ton, d/d station in bags.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—6d. to 7½d. per lb. Crude 60's 1s. 11d. to 2s. per gall. August/December.

ACID CRESYLIC 99/100.—2s. 2d. to 2s. 4d. per gall. B.P., 5s. per gall. 97/99.—2s. 1d. to 2s. 2d. per gall. Refined, 2s. 7d. to 2s. 10d. per gall. Pale, 95%, 1s. 9d. to 1s. 10d. per gall. 98%, 1s. 11d. to 2s. Dark, 1s. 6d. to 1s. 7d.

ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £4 10s. per ton.

ANTHRACENE OIL, STRAINED, 1080/1090.—4¾d. to 5½d. per gall. 1100, 5½d. to 6d. per gall.; 1110, 6d. to 6½d. per gall. Unstrained (Prices only nominal).

BENZOLE.—Prices at works: Crude, 10d. to 11d. per gall.; Standard Motor, 1s. 5d. to 1s. 6d. per gall.; 90%, 1s. 7d. to 1s. 8d. per gall.; Pure, 1s. 10d. to 1s. 11d. per gall.

TOLUOLE.—90%, 1s. 9d. to 1s. 11d. per gall. Pure, 1s. 11d. to 2s. 2d. per gall.

XYLOL.—1s. 5d. to 1s. 10d. per gall. Pure, 1s. 8d. to 2s. 1d. per gall.

CREOSOTE.—Cresylic, 20/24%, 6¾d. to 7d. per gall.; Heavy, for Export, 6¼d. to 6⅜d. per gall. Home, 4d. per gall. d/d. Middle oil, 4¼d. to 5d. per gall. Standard specification, 3d. to 4d. per gall. Light gravity, 1¼d. to 1⅜d. per gall. ex works. Salty, 7½d. per gall.

NAPHTHA.—Crude, 8½d. to 8¾d. per gall. Solvent, 90/160, 1s. 3d. to 1s. 3½d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 6d. per gall. Solvent 90/190, 11d.. to 1s. 2½d. per gall.

NAPHTHALENE, CRUDE.—Drained Creosote Salts, £3 to £4 per ton. Whizzed, £4 to £5 per ton. Hot pressed, £8 per ton.

NAPHTHALENE.—Crystals, £10 per ton. Purified Crystals, £14 10s. per ton. Flaked, £11 per ton.

PITCH.—Medium soft, 46s. to 47s. 6d. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 3s. 6d. to 4s. per gall. 90/160, 3s. 6d. to 3s. 9d. per gall. 90/180, 1s. 9d. to 2s. 3d. per gall. Heavy prices only nominal.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID GAMMA.—Spot, 3s. 9d. per lb. 100% d/d buyer s works.

ACID H.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.

ACID NAPHTHIONIC.—1s. 5d. per lb. 100% d/d buyer's works.

ACID NEVILLE AND WINTHER.—Spot, 2s. 7d. per lb. 100% d/d buyer's works.

ACID SULPHANILIC.—Spot, 8½d. per lb. 100% d/d buyer's works.

ANILINE OIL.—Spot, 8½d. per lb., drums extra, d/d buyer's works.

ANILINE SALTS.—Spot, 8½d. per lb. d/d buyer's works.

BENZALDEHYDE.—Spot, 1s. 8d. per lb., packages extra, d/d buyer's works.

BENZIDINE BASE.—Spot, 2s. 6d. per lb. 100% d/d buyer's works.

BENZOIC ACID.—Spot, 1s. 8½d. per lb. d/d buyer's works.

o-CRESOL 30/31° C.—£3 1s. 10d. per cwt., in 1 ton lots.

m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots.

p-CRESOL 34·5° C.—1s. 9½d. per lb., in ton lots.

DICHLORANILINE.—1s. 10d. per lb. f.o.r. works.

DIMETHYLANILINE.—Spot, 1s. 8d. per lb., drums extra d/d buyer's works.

DINITROBENZENE.—8d. per lb.

DINITROCHLORBENZENE.—£74 per ton d/d.

DINITROTOLUENE.—48/50° C., 7½d. per lb.; 66/68° C., 9d. per lb f.o.r. works.

DIPHENYLAMINE.—Spot, 1s. 8d. per lb. d/d buyer's works.

a-NAPHTHOL.—Spot, 1s. 11d. per lb. d/d buyer's works.

B-NAPHTHOL.—Spot, £65 per ton in 1 ton lots, d/d buyer's works.

a-NAPHTHYLAMINE.—Spot, 1s. per lb. d/d buyer's works.

B-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.

o-NITRANILINE.—5s. 11d. per lb.

m-NITRANILINE.—Spot, 2s. 6d. per lb. d/d buyer's works.

p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.

NITROBENZENE.—Spot, 6½d. per lb, 5-cwt. lots, drums extra, d/d buyer's works.

NITRONAPHTHALENE.—9d. per lb.

R. SALT.—Spot, 2s. per lb. 100% d/d buyer's works.

SODIUM NAPHTHIONATE.—Spot, 1s. 6½d. per lb. 100% d/d buyer's works.

o-TOLUIDINE.—Spot, 8d. per lb., drums extra, d/d buyer's works.

p-TOLUIDINE.—Spot, 1s. 9d. per lb. d/d buyer's works.

m-XYLIDINE ACETATE.—3s. 1d. per lb. ex works.

Wood Distillation Products

ACETATE OF LIME.—Brown, £9 15s. to £10 5s. per ton. Grey £16 10s. to £17 10s. per ton. Liquor, 9d. per gall.

ACETONE.—£78 per ton.

CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.

IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.

WOOD CREOSOTE.—1s. 9d. per gall., unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 8d. to 3s. 11d per gall. Solvent, 4s. to 4s. 3d. per gall.

WOOD TAR.—£3 10s. to £4 10s. per ton

BROWN SUGAR OF LEAD.—£38 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 2d. per lb., according to quality; Crimson, 1s. 3d. to 1s. 5d. per lb., according to quality

ARSENIC SULPHIDE, YELLOW.—1s. 8d. to 1s. 10d. per lb.

BARYTES.—£5 10s. to £7 per ton, according to quality.

CADMIUM SULPHIDE.—4s. 10½d. to 5s. 3d. per lb.

CARBON BISULPHIDE.—£26 to £28 per ton, according to quantity; drums extra.

CARBON BLACK.—3½d. to 4 1/16d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.
DIPHENYLGUANIDINE.—2s. 9d. per lb.
LITHOPONE, 30%.—£20 to £22 per ton.
SULPHUR.—£9 10s. to £13 per ton, according to quality.
SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.
SULPHUR PRECIP. B.P.—£55 to £60 per ton, according to quantity.
ZINC SULPHIDE.—8d. to 11d. per lb

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£37 per ton, ex wharf London, barrels free.
ACID, ACETYL SALICYLIC.—2s. 9d. to 2s. 11d. per lb., according to quantity.
ACID, BENZOIC B.P.—2s. to 2s. 3d. per lb., for synthetic product, according to quantity. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.
ACID, BORIC B.P.—Crystal, £31 per ton; powder, £32 per ton; For one ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—1s. 6d. to 1s. 6¾d. per lb., less 5%.
ACID, GALLIC.—2s. 11d. per lb. for pure crystal, in cwt. lots.
ACID, MOLYBDIC.—5s. 3d. per lb. in ¼ cwt. lots. Packages extra. Special prices for quantities and contracts.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.
ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 8d. per lb. Technical.—1s. to 1s. 2d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. 0½d. per lb., less 5%.
ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.
AMIDOL.—7s. 6d. to 9s. per lb., d/d.
AMIDOPYRIN.—7s. 9d. to 8s. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 9d. per lb., according to quantity. 18s. per lb. ex Gum.
AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.
AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ¼ cwt. lots. Packages extra. Special prices for quantities and contracts.
ATROPHINE SULPHATE.—9s. per oz.
BARBITONE.—5s. 9d. to 6s. per lb.
BENZONAPHTHOL.—3s. to 3s. 3d. per lb.
BISMUTH CARBONATE.—6s. 6d. per lb.
BISMUTH CITRATE.—6s. 9d. per lb.
BISMUTH SALICYLATE.—6s. 7d. per lb.
BISMUTH SUBNITRATE.—5s. 6d. per lb.
BISMUTH NITRATE.—Cryst. 4s. 4d. per lb.
BISMUTH OXIDE.—8s. 6d. per lb.
BISMUTH SUBCHLORIDE.—8s. per lb.
BISMUTH SUBGALLATE.—6s. 9d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W. Qts. 11d. per lb.
BORAX B.P.—Crystal, £21 10s. per ton; powder, £22 per ton; For one ton lots and upwards. Packed in 1 cwt. bags carriage paid any station in Great Britain.
BROMIDES.—Ammonium, 1s. 9d. per lb.; potassium, 1s. 5½d. per lb.; granular, 1s. 5d. per lb.; sodium, 1s. 8d. per lb. Prices for 1 cwt. lots.
CALCIUM LACTATE.—B.P., 1s. 1½d. to 1s. 3d. per lb., in 1 cwt. lots.
CAMPHOR.—Refined flowers, 3s. to 3s. 2d. per lb., according to quantity; also special contract prices.
CHLORAL HYDRATE.—3s. 1d. to 3s. 4d. per lb.
CHLOROFORM.—2s. 4½d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
ETHERS.—S.G. ·730—1s. to 1s. 1d. per lb., according to quantity; other gravities at proportionate prices.
FORMALDEHYDE, 40%.—37s. per cwt., in barrels, ex wharf.
GUAIACOL CARBONATE.—4s. 6d. to 4s. 9d. per lb.
HEXAMINE.—2s. 3d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 3s. per gall.
HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 2s. 5d. per lb.; potassium, 2s. 8½d. per lb.; sodium, 2s. 7½d. per lb., in 1 cwt. lots, assorted.
IRON AMMONIUM CITRATE.—B.P., 2s. 5d. per lb. for 28 lb. lots. Green, 3s. 1d. per lb., list price. U.S.P., 3s. 3d. per lb. list price.
IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.
IRON QUININE CITRATE.—B.P., 8½d. to 8¾d. per oz., according to quantity.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.
MENTHOL.—A.B.R. recrystallised B.P., 15s. 6d. per lb. net; Synthetic, 9s. 6d. to 11s. per lb.; Synthetic detached crystals, 9s. 6d. to 11s. per lb., according to quantity; Liquid (95%), 9s. per lb.
MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, crystals, 8s. 4d to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 3d. to 1s. 5d. per lb.
METHYL SULPHONAL.—18s. 6d. to 20s. per lb.
METOL.—9s. to 11s. 6d. per lb. British make.
PARAFORMALDEHYDE.—1s 9d. per lb. for 100% powder.
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—3s. 9d. to 4s. 1d. per lb.
PHENAZONE.—5s. 6d. per lb.
PHENOLPHTHALEIN.—5s. 11d. to 6s. 1½d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—90s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P.C., 2s. 3d. per lb. in 28 lb. lots. Smaller quantities 1d. per lb. more.
POTASSIUM FERRICYANIDE.—1s. 7½d. per lb., in 125 lb. kegs
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1 cwt. kegs included f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d per lb., spot.
QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins
RESORCIN.—2s. 10d. to 3s. per lb., spot.
SACCHARIN.—43s. 6d. per lb.
SODIUM BENZOATE B.P.—1s. 9d. per lb. for 1-cwt. lots.
SODIUM CITRATE, B.P.C., 1911, AND U.S.P. VIII.—1s. 11d. per lb., B.P.C. 1923, and U.S.P. IX—2s. 3d. per lb. Prices for 28 lb. lots. Smaller quantities 1d. per lb. more.
SODIUM FERROCYANIDE.—4d. per lb., carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—95s. to 100s. per cwt. net. Crystals, 2s. 6d. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 10d. to 2s. 2d. per lb. Crystal, 1s. 11d. to 2s. 3d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £29 10s. per ton, according to quantity. Delivered U.K.
SULPHONAL.—9s. 6d. to 10s. per lb.
TARTAR EMETIC, B.P.—Crystal or powder, 1s. 9d. to 2s. per lb.
THYMOL.—Puriss, 8s. 3½d. to 9s. 2d. per lb., according to quantity. Natural, 12s. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.
AUBEPINE (EX ANETHOL).—12s. per lb.
AMYL ACETATE.—2s. 6d. per lb.
AMYL BUTYRATE.—5s. per lb.
AMYL CINNAMIC ALDEHYDE.—10s. per lb.
AMYL SALICYLATE.—2s. 6d. per lb.
ANETHOL (M.P. 21/22° C.).—7s. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—1s. 10d. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 10d. per lb.
BENZYL BENZOATE.—2s. 6d. per lb.
CINNAMIC ALDEHYDE NATURAL.—13s. 3d. per lb.
COUMARIN.—11s. per lb.
CITRONELLOL.—8s. per lb.
CITRAL.—8s. per lb.
ETHYL CINNAMATE.—6s. 6d. per lb.
ETHYL PHTHALATE.—2s. 9d. per lb.
EUGENOL.—9s. 3d. per lb.
GERANIOL (PALMAROSA).—17s. per lb.
GERANIOL.—7s. 6d. to 10s. per lb.
HELIOTROPINE.—6s. per lb.
ISO EUGENOL.—11s. 6d. per lb.
PHENYL ETHYL ACETATE.—11s. per lb.
PHENYL ETHYL ALCOHOL.—9s. per lb.
RHODINOL.—46s. per lb.
SAFROL.—2s. per lb.
TERPINEOL.—1s. 6d. per lb.
VANILLIN, EX CLOVE OIL.—13s. 6d. to 15s. per lb. Ex Guaiacol. 12s. 6d. to 13s. 9d. per lb.

Essential Oils

ALMOND OIL.—Foreign S.P.A., 10s. per lb.
ANISE OIL.—No supplies available on spot.
BERGAMOT OIL.—10s. per lb
BOURBON GERANIUM OIL.—21s. per lb.
CAMPHOR.—Brown, 1s. 9d. per lb.
CANANGA.—Java, 9s. per lb.
CASSIA OIL, 80/85%.—4s. 6d. per lb.
CINNAMON OIL LEAF.—6s. 9d. per oz.
CITRONELLA OIL.—Java, 2s. 5d. per lb., pure, Ceylon, 2s. 5d. per lb., c.i.f. U.K. port.
LAVENDER OIL.—Mont Blanc, 38/40%, 10s. 6d. per lb.
PEPPERMINT OIL.—English, 55s. per lb.; Wayne Cty., 12s. 3d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, August 28, 1930.

THERE has been a fair volume of business placed during the current week, and prices in the main are unchanged. There is rather more interest being shown by consumers for their forward requirements, and from certain export markets there has been a welcome improvement in the demand for a number of heavy products.

General Chemicals

ACETONE.—In fairly good request at the firm rates of £71 10s. to £80 per ton, according to quantity.

ACID ACETIC.—Now steady at £36 5s. to £38 5s. per ton for technical 80%, and £37 5s. to £39 5s. for pure 80%, according to quantity, delivered to buyers' works, and there is a rather better demand.

ACID CITRIC.—Continues inactive at about 1s. 6½d. per lb., less 5%.

ACID LACTIC.—Has been in good request, and price is firm at about £41 to £42 per ton for 50% by weight, pale quality.

ACID OXALIC.—Market continues firm, with a very good demand. Present prices £30 7s. 6d. to £32 per ton, according to quantity.

ACID TARTARIC.—A slight improvement in the demand is reported, although price shows no improvement at about 1s. 1d. per lb., less 5%.

ALUMINA SULPHATE.—A steady demand has been received, with price firm at £8 to £8 15s. per ton for the 17/18% iron free quality.

ARSENIC.—Rather more interest has been shown in this product, and price, if anything, is a shade firmer. Current price about £16 per ton, f.o.r. at the mines.

CREAM OF TARTAR.—Only in small request, and is quoted at 88s. to 90s. per cwt., ex warehouse London.

COPPER SULPHATE.—In better demand, with rather a firmer tendency at £21 to £22 per ton, f.o.r. London.

FORMALDEHYDE.—The market continues quietly steady at about £32 per ton, ex wharf London, and there is a regular demand.

LEAD ACETATE.—There is only a small demand for brown material at about £39 per ton, with white in rather better request at £40 per ton.

LEAD NITRATE.—Unchanged at £29 10s. to £30 per ton.

LITHOPONE.—There has been more business placed, with the market firm at £19 15s. to £23 per ton, according to grade.

CARBONATE OF POTASH.—Unchanged at about £28 to £29 per ton for 96/98% arsenic free quality.

PERMANGANATE OF POTASH.—A fairly good demand is being received at about 5½d. per lb. for the B.P. needle crystals.

PRUSSIATE OF POTASH.—Rather firmer conditions are reported, with an active demand. Prices so far are unchanged at £63 10s. to £65 10s. per ton, according to quantity.

SODA BICHROMATE.—Firm at 3¾d. per lb., with usual discounts for contracts and in everyday demand.

SODIUM HYPOSULPHITE.—There is a brisk demand for photographic crystals at about £14 15s. per ton, with commercial in rather slow demand at about £8 10s.

SULPHIDE OF SODA.—Steady at £10 5s. to £11 5s. per ton for solid, and £11 5s. to £12 5s. per ton for broken, according to quantity, carriage paid.

TARTAR EMETIC.—In a little better request at 11d. per lb.

ZINC SULPHATE.—Slow at about £12 10s. per ton.

Coal Tar Products

There is no change to report in the coal tar products market, which remains quiet, but prices are being maintained.

MOTOR BENZOL.—Remains at about 1s. 5½d. to 1s. 6½d. per gallon, f.o.r.

SOLVENT NAPHTHA.—Unchanged at about 1s. 2½d. to 1s 3d. per gallon.

HEAVY NAPHTHA.—Quoted at about 1s. 1d. per gallon, f.o.r.

CREOSOTE OIL.—Unaltered at 3d. to 3½d. per gallon, f.o.r. in the North, and at 4d. to 4½d. per gallon in London.

CRESYLIC ACID.—Remains at 2s. per gallon for the 98/100% quality, the dark quality 95/97% being quoted at 1s. 10d. per gallon.

NAPHTHALENES.—The firelighter grade is offered at £3 10s. to £3 15s. per ton, the 74/76 quality at about £4 to £4 5s. per ton, and the 76/78 quality at about £5 per ton.

PITCH.—Remains at a nominal figure of 37s. 6d. to 42s. 6d. per ton, f.o.b. East Coast port.

Latest Oil Prices

LONDON, August 27.—LINSEED OIL was firm and 10s. to 12s. 6d. per ton higher. Spot unchanged, £32; September, £30 15s.; September-December, £30 7s. 6d.; and January-April, £28 12s. 6d., naked. RAPE OIL was inactive. Crude, extracted, £34; technical refined, £35 10s., naked, ex wharf. COTTON OIL was quiet. Egyptian crude, £27; refined common edible, £32 10s.; and deodorised, £34, naked, ex mill. TURPENTINE was quiet and 3d. per cwt. lower. American, spot, 36s. 3d.; September-December, 37s.; Russian, spot, 34s.

HULL.—LINSEED OIL.—Spot, £32 5s.; August, £32; September, £31 10s.; September-December, £31 2s. 6d.; January-April, £29 10s. per ton, naked. COTTON OIL.—Egyptian, crude, spot, £26 10s.; edible refined, spot, and technical, spot, £30; deodorised, spot, £32 per ton, naked. PALM KERNEL OIL.—Crude, 5½ per cent., spot, £27 per ton, naked. GROUNDNUT OIL.—Crushed/extracted, spot, £30 10s.; deodorised, spot, £34 10s. per ton. SOYA OIL.—Extracted and crushed, spot, £27 10s.; deodorised, spot, £31 per ton. RAPE OIL.—Crushed/extracted, spot, £34 10s.; refined, spot, £36 10s. per ton. TURPENTINE.—Spot, 38s. 6d. per cwt. CASTOR OIL and COD OIL unchanged.

Scottish Coal Tar Products

WATER white products have been in better request during the week, but values are unchanged. There is very little interest being taken in other products and quotations are unsteady.

Cresylic Acid.—The demand is moderate with prices easy. Pale 99/100%, 1s. 9½d. to 1s. 10½d. per gal.; pale, 97/99%, 1s. 8½d. to 1s. 9½d. per gal.; dark, 97/99%, 1s. 7½d. to 1s. 8½d. per gal.; high boiling, 1s. 9d. to 1s. 11d. per gal.; all in buyers' packages f.o.r.

Carbolic Sixties.—Little or no business is being placed and value is nominal at 2s. to 2s. 2d. per gal.

Creosote Oil.—Orders are spasmodic and, as stocks remain high, prices are weak. Specification oil, 2¾d. to 3¼d. per gal.; gas works ordinary, 3d. to 3¼d. per gal.; washed oil, 3d. to 3½d. per gal.; all in bulk quantities ex works.

Coal Tar Pitch.—There is still a dearth of enquiries. The nominal value for export is 45s. to 47s. 6d. per ton f.a.s. Glasgow and for home, about 47s. 6d. per ton ex works.

Blast Furnace Pitch.—Quiet at controlled prices of 30s. per ton, f.o.r works, for home trade, and 35s. per ton, f.a.s. Glasgow, for export.

Refined Coal Tar.—New business is scarce and value is easy at 3d. to 3½d. per gal. naked at makers' works.

Blast Furnace Tar.—Unchanged at 2¾d. per gal. f.o.r.

Crude Naphtha.—There is a fair demand at 4d. to 4¼d. per gal. f.o.r. makers' works in bulk.

Water White Products.—More business is passing, but prices remain unaltered. Motor benzole, 1s. 5½d. to 1s. 6d. per gal.; solvent naphtha, 90/160, 1s. 2½d. to 1s. 3½d. per gal.; heavy naphtha, 90/190, 1s. to 1s. 1d. per gal., all free on rails works.

South Wales By-Products

THERE is very little change to report in South Wales by-product activities. All sections remain quiet and the immediate prospects are not good. Pitch continues slow, stocks being heavily in excess of demand, with values nominal from 44s. to 46s. per ton f.o.b. Creosote is inactive at about 3¾d., and heavy naphtha at from 11d. to 1s. 1d. per gallon. Solvent naphtha has a steady, if moderate, call at about 1s. 3½d. per gallon. Motor benzol continues to have a fair call, and the same remark applies to refined tars, values for gas works and coke-oven tar being unchanged. Road tar is in moderate request at about 13s. per 40-gallon barrel delivered. Sulphate of ammonia has scarcely any call at £10 2s. per ton. Coke and patent fuel exports are slightly better, but are far from satisfactory. Patent fuel prices, for export, are as follows: 21s. 6d. to 22s., ex-ship Cardiff; 20s. to 21s., ex-ship Swansea; 20s., ex-ship Newport. Coke prices are: Best foundry, 35s. to 37s.; good foundry, 27s. 6d. to 32s. 6d.; furnace, 21s. to 21s. 6d. Oil imports into Swansea during the four weeks ending August 19 amounted to 23,627,075 gallons.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing this firm's independent and impartial opinions.*

Glasgow, August 26, 1930.

THE market remains dull, industrial depression continuing to have a marked effect. Prices at present are touching rock bottom.

Industrial Chemicals

ACETONE B.G.S.—£71 10s. to £80 per ton, ex wharf, according to quantity. Inquiry remains satisfactory.

ACID ACETIC.—Prices ruling are as follows:—Glacial 98/100%, £47 to £58 per ton; pure, £37 5s. per ton; technical 80%, £36 5s. delivered in minimum 1 ton lots.

ACID BORIC.—Granulated, commercial, £22 per ton; crystals, £23; B.P. crystals, £31 per ton; powder, £32 per ton, in 1 cwt. bags delivered free, Great Britain, in 1 ton lots and upwards.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. per carboy, ex works, full wagon loads.

ACID NITRIC 80° quality.—£23 per ton, ex station, full truck loads.

ACID OXALIC 98/100%.—On offer at the same price, viz., 3¼d. per lb., ex store. Offered from the Continent at 3¼d. per lb., ex wharf.

ACID SULPHURIC.—£3 2s. 6d. per ton, ex works, for 144° quality; £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC B.P. CRYSTALS.—Quoted 1s. 1d. per lb., less 5% ex wharf. On offer for prompt delivery from the Continent at 1s. 2½d. per lb., less 5% ex wharf.

ALUMINA SULPHATE.—Quoted at round about £8 15s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 7s. 6d. per ton, c.i.f. U.K. ports. Crystal meal, about 2s. 6d. per ton less.

AMMONIA ANHYDROUS.—Quoted 10½d. per lb., containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton; powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID 80°.—Unchanged at about 2½d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Spot material obtainable at round about £30 per ton, ex wharf. On offer for shipment from China at about £27 per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Quoted £18 per ton, ex wharf, prompt shipment from mines. Spot material still on offer at £19 15s. per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £11 per ton, c.i.f. U.K. ports. For Continental material our price would be £10 per ton, f.o.b. Antwerp or Rotterdam.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 15s. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 15s. per ton to £5 5s. per ton, according to quantity and point of delivery. Continental material on offer at £4 15s. per ton, c.i.f. U.K. ports.

COPPERAS GREEN.—At about £3 15s. per ton, f.o.r. works or £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE 40%.—Now quoted £33 per ton, ex store. Continental material on offer at about £32 per ton, ex wharf.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 per ton, ex wharf.

LEAD, RED.—Price now £33 per ton, delivered buyers' works.

LEAD, WHITE.—Quoted £46 per ton, c.i.f. U.K. ports.

LEAD, ACETATE.—White crystals quoted round about £39 to £40 per ton, ex wharf. Brown on offer at about £2 per ton less.

MAGNESITE, GROUND CALCINED.—Quoted £9 per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality, 64 O.P., quoted 1s. 8d. per gallon, less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4½d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance for contracts.

POTASSIUM CARBONATE.—Spot material on offer at £26 10s. per ton, ex store, offered from the Continent at £25 5s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99¾/100% POWDER.—Quoted £26 5s. per ton, ex store. Crystals, 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £20 17s.6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Quoted 5d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 7d. per lb., ex store. Offered for prompt delivery from the Continent at about 6¾d. per lb., ex wharf.

SODA, CAUSTIC.—Powdered 98/99%, £17 10s. per ton, in drums, £18 15s. per ton in casks. Solid 76/77% £14 10s. per ton in drums, £14 12s. 6d. per ton for 70/72% in drums, all carriage paid buyers' station. Minimum 4-ton lots. For contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recrystallised £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3¾d. per lb. delivered buyers' premises, with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality 27s. 6d. per ton extra. Light soda ash £7 13s. per ton, ex quay, minimum 4-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum 4-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum 4-ton lots.

SODIUM NITRATE.—Chilean producers now offer at £10 2s. per ton, carriage paid buyers' sidings, minimum 6-ton lots, but demand in the meantime is small.

SODIUM PRUSSIATE.—Quoted 5¼d. per lb., ex store. On offer at 5d. per lb., ex wharf, to come forward.

SODIUM SULPHATE (SALTCAKE).—Prices 55s. per ton, ex works, 57s. 6d. per ton delivered, for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption: solid 61/62%, £10 broken 60/62%, £11 per ton. Crystals 30/32%, £8 2s. 6d. per ton, all delivered buyers' works on contract minimum 4-ton lots. Special prices for some consumers. Spot material, 5s. per ton extra. Crystals, 2s. 6d. per ton extra.

SULPHUR.—Flowers, £12 per ton; Roll, £10 10s. per ton; rock, £9 5s. per ton; ground American, £9 5s. per ton, ex store.

ZINC CHLORIDE 98%.—British material now offered at round about £20 per ton f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £12 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

German Lacquer Manufacturers' Association

IT is reported that there was recently formed in Germany an association composed of a number of important manufacturers of nitrocellulose lacquers with the title "Interessenverband Deutscher Lackfabriken G.m.b.H." The purpose is, to some extent, co-operative research and marketing, but its main object is the co-operative purchase of raw materials. The following is a list of companies who are members of the new association, the address of which is 57, Berlinerstrasse, Berlin-Charlottenburg:—Glasuritwerke M. Winkelmann A.-G., Hamburg and Hiltrup; Herbig-Haarhous A.-G., Koln-Bickendorf; Zoellner-Werke A.-G., Berlin-Neukoln; Tempoloid-Lack G.m.b.H., Berlin-Charlottenburg (consisting of the firms Chr. Lechler und Sohn Nachf. A.-G., Feuerbach bei Stuttgart; Conrad Wm. Schmidt G.m.b.H., Düsseldorf; Hermann Wulfing A.-G., Wuppertal-Vohwinkel).

Linseed Oil in Canada

EIGHT establishments were manufacturing linseed oil in Canada during 1929, according to a report recently released by the Dominion Bureau of Statistics. Their total capital investment was $2,708,378, and 239 employees were engaged in the industry. The annual output of raw linseed oil amounted to 3,295,255 imperial gallons, having a selling value at the mill of $2,637,581. The production of boiled linseed oil totalled 1,047,646 gallons, with a sales value at the mill of $837,070. The quantity of linseed oil available in Canada in the year (the total production of both grades of oil, namely, 4,342,901 gallons, plus the 1929 imports of 143,502 gallons) was 4,486,403 imperial gallons. Exports were 1,995 gallons during the year, and the apparent domestic consumption was 4,484,408 imperial gallons.

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SULPHURIC ACID, all strengths; Oleum, Monohydrate, Battery Acid, Pure Acids, etc.

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LIQUOR AMMONIA, all strengths; Liquor Ammonia Puriss, Sulphate of Ammonia, etc.

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RED LEAD, and other products.

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FRANK SEGNER & Co., Ltd.,
Yorkshire House, Cross St.,
MANCHESTER.
Telephone: Blackfriars 7621. Telegrams: "Segner," Manchester.

THE ILLUSTRATION SHOWS THE SALTCAKE PLANT.

Manchester Chemical Market

[From Our Own Correspondent.]

Manchester, August 28, 1930.

The slightly more hopeful feeling noted a week ago in respect of the chemical market on this centre has not yet resulted in any actual expansion in the demand, and business during the past week has been on only a relatively quiet scale, with no general disposition on the part of buyers to commit themselves very far in advance of current requirements. Inquiry at the moment is on moderate lines, but some improvement in this respect is anticipated within the next few weeks. Taking the market generally, some easiness is still in evidence, but most lines are reasonably steady.

Heavy Chemicals

Bicarbonate of soda is in fair request, and values are well held at £10 10s. per ton. The demand in the case of sulphide of sodium is on the quiet side, and at about £7 15s. per ton for the commercial product, and from £8 10s. to £9 for the 60-65 per cent. concentrated solid quality prices are not too strong. Phosphate of soda is slow, with current offers of the dibasic material at about £11 per ton. Prussiate of soda is a steady section at from 4¾d. to 5¼d. per lb., according to quantity, and a fair demand is reported. A moderate amount of buying interest is being shown in chlorate of soda at the lower rates, prices being at from about £24 to £24 10s. per ton. There is a quietly steady demand about for alkali at round £6 per ton. With regard to caustic soda, delivery specifications against contracts are of fair extent, and values are firm at from £12 15s. to £14 per ton, according to quality. Saltcake meets with a quiet demand, with offers at up to £3 per ton. There has been no change in the price position of hyposulphite of soda, the photographic grade being quoted at about £15 5s. per ton and the commercial material at £9. Bichromate of soda is in quietly steady demand, with prices maintained on the basis of 3⅜d. per lb., less 1 to 3½ per cent.

Among the potash products, permanganate is moving in relatively small quantities, but values in this section keep up at about 5¼d. per lb. for the commercial material and 5½d. for B.P. Carbonate of potash is attracting only limited attention, with offers at up to £25 per ton. Bichromate of soda is steady at 4⅛d. per lb., and a fair business is being put through. Chlorate of potash is quoted to-day at round £25 10s. per ton, but the demand just now is rather subdued. There is not much doing in caustic potash, but offers are fairly steady at about £30 per ton. Yellow prussiate of potash is firm and in fair request at from 6¾d. to 7¼d. per lb., according to quantity.

Sulphate of copper is definitely easy at round £22 per ton, f.o.b., and current sales of the material are on moderate lines. The demand for arsenic is rather quiet, but values are reasonably steady at about £16 per ton at the mines, for white powdered, Cornish makes. Quotations for the acetates of lime are pretty well where they were a week ago, but inquiry is not at all active; the brown material is quoted at £7 10s. per ton and the grey at £14 10s. The lead compounds are steady at round £29 10s. per ton for the nitrate, and £36 and £35 for the white and brown acetates.

Acids and Tar Products

Offers of citric acid this week have been a shade under the highest figure recently quoted, current prices being at about 1s. 6¼d. per lb., with business on a quiet scale. Tartaric acid is in limited demand, but values are not too strong at from 1s. to 1s. 0¼d. per lb. With regard to oxalic acid, quotations keep up at about £1 12s. per cwt., ex store, but the buying movement is very moderate. Acetic acid is in quiet demand, with the glacial quality at from £47 to £51 per ton, according to quantity, and the 80 per cent. commercial grade at £37 per ton, in ton lots.

Pitch is meeting with a certain amount of inquiry for shipment at from 45s. to 47s. 6d. per ton, f.o.b. There is only a quiet business passing in creosote oil, but prices are unchanged at 3½d. to 4½d. per gallon, naked, at works. Carbolic acid crystals are in moderate request at from 6½d. to 7¼d. per lb., f.o.b., according to quantity, with crude at up to 2s. 2d. per gallon. Solvent naphtha is maintained at about 1s. 2d. per gallon, naked, and a fair demand is reported.

Company News

North Broken Hill.—Dividend No. 83 of 1s. per share, is announced, payable on September 29.

British Cotton-Seed Products.—The accounts for the year to March 31 last showed a profit of £152 (against £1,437), which, added to balance of £2,149 brought forward, makes a credit of £2,301. The annual meeting will be held at Cannon Street Hotel, London, on August 29, at noon.

United Turkey Red Co.—The directors do not recommend the payment of an interim dividend on the Ordinary shares, due at this time of year. Last year an interim dividend of 3 per cent. actual, less tax, was paid, this being followed by a final of a similar amount, making 6 per cent. for the year, against 10 per cent. distributed in the previous period.

Broken Hill Proprietary Co.—The net profit for the year to May 31, 1930, was £161,889, against £332,670, after providing £256,696 (£417,592) for depreciation and £73,032 (£81,094) for debenture interest. After due provision for all outstanding liabilities, there remain liquid assets £487,988, against £791,816, in cash and other convertible stocks which, however, does not include interests in other companies, but is inclusive of reserve and insurance funds.

Calico Printers' Association.—After providing £501,607 for maintenance, depreciation, repairs, renewals and upkeep, and £128,000 for debenture interest, the accounts for the year ended June 30 last show a profit of £69,186, which, with £61,536 brought forward, makes the total to the credit of the profit and loss account £130,722. An interim dividend for the half-year ended December 31, 1929, amounting to £75,402, has been paid on the preference shares, and the directors have resolved to recommend to the shareholders that £50,000 be transferred to profit and loss account from reserve for equalisation of dividends, and that a dividend be declared on the preference shares for the half-year ended June 30 last at the rate of 5 per cent. per annum, leaving the sum of £29,917 to be carried forward.

United Indigo and Chemical Co., Ltd.—A decline of £7,756 in trading profits is shown in the accounts for the year ended June 30, 1930, as compared with the previous period. Income from investments, etc., at £5,477 compares favourably with that obtained in the preceding year, and after meeting general charges, there is a net profit of £11,950, against £17,822. After crediting the amount brought in, the available balance is £27,528, against £33,390. The preference shares receive the minimum 5 per cent. dividend, and a like amount is being distributed on the ordinary shares. Last year both classes of capital received 7½ per cent. The ordinary dividend requires £4,375, against £6,562 a year ago, and the preference £7,500, against £11,250. The carry forward of £15,653 is slightly more than the amount brought in.

Tariff Changes

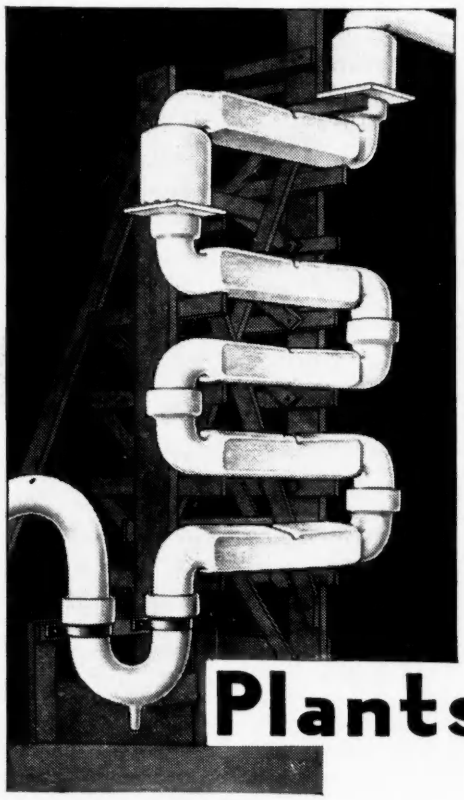
Costa Rica.—Refractory bricks and earths, formerly dutiable at 6 cts. per kilog. are now duty free.

Czechoslovakia.—By virtue of a Decree dated June 30, licences are no longer required for the exportation of potash. The importation of superphosphates is, however, subjected to licence requirement.

Italy.—A Royal Decree-Law, dated July 3, provides that residues from the distillation of mineral oils, containing not more than 20 per cent. by weight of oils distilling up to 300° and intended for mixing with natural solid bitumens are to be assimilated, for Customs purposes, to "solid bitumens" (Tariff No. 563), subject to compliance with any regulations that may be laid down by the Minister of Finance. The duty payable under this classification is 0·50 gold lire per 100 kilogs.

Dope Factory Explosion

The factory of Titanine-Emaillite, Ltd., aeroplane dope manufacturers of Sheaveshill Avenue, Colindale, near Hendon, was the scene of a big explosion and fire late on Wednesday night. Four firemen were overcome by fumes, and owing to the danger of further explosions nearly 400 people living near the factory were ordered to leave their homes.



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Coal Distillation in Australia

Various Processes Considered

IN the annual report for the year 1929 of the Department of Mines of New South Wales, appears a section on coal utilisation, with particular reference to the suitability of the various processes to New South Wales coal. The report is summarised as follows :—

High Temperature Distillation.—High Temperature distillation has been proved definitely to have a commercial application to Australian conditions in the production of metallurgical coke, gas, benzine, and so on. Excellent examples are afforded by the work of the Broken Hill Proprietary at Newcastle, and the Australian Gas Light Company at Sydney. The motor spirit fraction produced by this process, however, is so small (not greater than two gallons to the ton of coal treated) that it cannot be expected to solve either the " oil " or the present " coal " problem of New South Wales.

Low Temperature Distillation.—This process holds out great promise generally in connection with the production of : (a) Semi-coke for domestic purposes, for pulverised fuel, for general firing purposes, for blending with high volatile coal in the preparation of metallurgical coke, and so on ; (b) tar-oil as a base for the preparation of motor spirit, synthetic resins and plastics ; (c) tar-oil as raw material for hydrogenation processes ; (d) gas of high calorific value. The main problem, however, which confronts the engineer in any attempt to apply low temperature distillation to New South Wales conditions commercially is that the material (say Greta Coal) is expensive to mine and is already a high grade product in the raw state.

Hydrogenation

Hydrogenation.—The para-bituminous coals (carbon content of total combustibles, 84-87 per cent., hydrogen 5·0 to 5·8 per cent.) of the Main Coal Province appear to be admirably adapted for " Hydrogenation." Many of the collieries working the Greta and Borehole seams possess coal approaching this composition. Such coals may be expected to yield at least 30 gallons of motor spirit to the ton of coal treated. Low temperature distillation tar-oils may also be hydrogenated, as at Leuna, Germany, for motor spirit, for gas oil or for Diesel engine fuel. These hydrogenation processes are regarded as more or less developed to the commercial stage in the Northern Hemisphere, but the capital cost of experimentation, of the treatment plant, together with the heavy cost of hydrogen itself for the treatment, of advertising and distribution, indicate that no immediate relief of the present acute coal position is to be sought by the application of this process to Australian conditions ; nevertheless, it may well be that this process, combined with low temperature distillation, will be successful within a few years.

Methanol, Synthol and other Synthetic Products.—In connection with the proposed conversion of methane into benzine, together with the production of synthol, methanol, and so on, from water-gas, it may be pointed out that the relative importance of these methods still remains to be proved, especially with regard to their application to Australian conditions.

Reduced Phosphate Stocks in North Africa

A VERITABLE phosphate famine is being experienced in North Africa. The stocks of the producers, both at the mines and in the ports, are reduced to a minimum, so that in many cases vessels have been obliged to wait for cargoes. The companies are making all possible efforts toward increasing their production, but are being held up by scarcity of manual labour. The contracts in force will be fulfilled, but some time will certainly elapse before the normal stocks are re-established.—U.S.A. Assistant Trade Commissioner Earle C. Taylor, Paris.

Chilean Sulphur Consumption

THE closing of several nitrate plants in the provinces of Tarapaca and Antofagasta, Chile, has brought about a decrease in the demand for sulphur produced in the Arica consular district. Only 982 metric tons of sulphur were shipped to other Chilean ports during the quarter ended March 31, 1930, as compared with 1,735 metric tons for the previous quarter. Chile's total annual sulphur production is approximately 12,500 metric tons.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

London Gazette, &c.

Company Winding Up Voluntarily

PALATINE CHEMICAL CO., LTD. (C.W.U.V., 30/8/30.) By special resolution, August 19, J. W. Westhead, chartered accountant, 6, Birley Street, Blackpool, appointed as liquidator.

Partnership Dissolved

CHAMPION DRUCE AND CO. (Charles Carey DRUCE and Herbert ROCKE), whitelead manufacturers and corroders and colour paint and varnish manufacturers and merchants, 35 and 37, Southgate Road, Islington, N., Caledonian Road, N., and 6, Laurence Pountney Hill, E.C., as from July 17, 1930.

Order Made on Application for Discharge

SAPER, Lewis, manufacturing chemist, lately 5-9, White Lion Street, Bishopsgate, London, E.1. (O.M.A.D., 30/8/30.) Discharge suspended for three months, until October 29.

Receivership

BRITISH SULPHIDES SMELTING CO., LTD. (R., 30/8/30.) A. J. Griffin, of 14, Hanover Square, W.1, was appointed receiver and manager on August 9, 1930, under powers contained in debenture dated May 20, 1930.

New Companies Registered

CRYSTAL ANALYSIS, LTD.—Registered August 21. Nominal capital, £100 in £1 shares. Analysts of materials of all kinds by radiological, spectroscopic, physical, chemical, metallurgical and other means ; metallurgists, metallurgical, analytical and industrial chemists, etc. Directors: J. P. Jackson (permanent director and chairman), 23, St. James's Road, Edgbaston, Birmingham ; A. F. Ridley.

F. G. STOKES, LTD., Hartington Road, Broadheath, Cheshire.—Registered August 21. Nominal capital, £12,000 in £1 shares (8,000 8 per cent. participating cumulative preference and 4,000 ordinary). Manufacturers of synthetic resins and insulating moulding compounds, formerly carried on by Frederick G. Stokes, at Hartington Road, Broadheath, Cheshire, manufacturers and merchants of chemicals, chemical products, moulds, moulding equipment and hydraulic presses, etc. Directors : F. G. Stokes, E. J. Lassen.

Chemical Trade Inquiries

The following inquiries, abstracted from the " Board of Trade Journal " have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

CANADA.—A manufacturers' agent in Vancouver desires to obtain British agencies on a commission basis for British Columbia of dyestuffs as used by pulp and paper mills. (Ref. No. 181.)

SOUTH AFRICA.—An important firm of exporters in Johannesburg desires to obtain the representation for the Transvaal of British manufacturers of fertilisers. (Ref. No. 185.)

A manufacturers' agent in Johannesburg wishes to represent manufacturers of special paint and linseed oil. (Ref. No. 186.)

Proposed Manchurian Nitrogen Plant

THE South Manchuria Railway Co. has under consideration (reports the U.S.A. Consul-General at Mukden) the establishment of a nitrogen plant at Anshan, the seat of the Anshan Iron and Steel Works, important producers of pig iron. It was recently announced that part of the equipment for the proposed plant had been bought in Germany but that no definite date had been set for its construction. The proposed plant would have an annual production of 100,000 tons of ammonium sulphate, which now is quoted at less than 100 yen per ton. The drop in prices since the plant was first proposed necessitates that the economics of the project be further studied before construction.